UPDATE! $4.95 January 1990

ComputerSystems

Take it to the Limit

A Quarterly Magazine for the users

EXPLORING THE POWER

OF

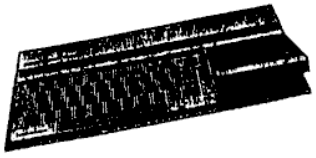
SINCLAIR COMPUTERS

THE CAMBRIDGE Z88
Portable Power

THE SINCLAIR QL
32 Bit Power House

THE SINCLAIR TIMEX TS-2068
Versatile Desk Topper

In this issue. . .



* EXPLORING MS-DOS * LINKING COMPUTERS * GETTING COMFORTABLE WITH EASEL

* TS-2068 SPRITES * PASCAL * SLAVE PROCESSING * PLOTTING RADICALS

* PRINTER SET UPS * REVIEWS- PC CONQUEROR - FLASH BACK * Z88 HINTS AND TIPS

PLUS- NEW ISSUE DISKS FOR BOTH THE SINCLAIR QL AND THE TS-2068

UPDATE MAGAZINE
1317 Stratford Ave.
Panama City, FL 32404
904 871 3556

NEWS AND NEW PRODUCTS

LKDOS SOFT-WARE

MAXCOM 300/1200 baud Terminal/BBS

This full feature modem software lets you effectivly link the modem to the disk, so you can upload or download files larger than 100K.This lets you send NMI saves and large text files as well as Basic or Code files, which other modem programs couldn't send because of memory limitations. Also files can be sent with or without a information headar (Spec-term compatible) .

It also has a 64 column display and is the only 2068 modem program that will run at full 1200 baud without missing characters. Other features of the terminal mode are IBM graphic characters, auto-dialer, macro keys, 110K disk buffer for captured text, auto repeat keys.

The BBS is the most elaborate available for the 2068 and allows the remote user full access to the disk drives similar to a CPM BDS. Features of the BBS are - 300/1200 baud, operation with fast reponce even at 1200 baud, Passwords, priority levels, Use time limits, Multiple Message Bases, Uploads and Downloads are not limited by Memory, Dual Window Monitor screen, Interupt driven time out and Hangup protection, Also Keeps a User log of callers Names and Activity on disk so a printer isnt needed and its easily customised and expanded.

MAXCOM can be used with the 2050 modem or with the Z-SIO RS232 interface and a 300/1200 baud modem. (a version for the Aerco RS232 is in the works).

PRICE: $24.95

LARKEN DISK EDITOR

This program lets you examine or change any byte on a LKdos disk. It is useful in repairing damaged or glitched disks, changing the disk Name or head speed etc. You can also examine the track map and disk info headers.

The documentation for the disk editor also includes information on how to access LKdos from Machine Code and information on the structure of the disk catalog and data blocks.

PRICE: $15.00

SEQUENTIAL/RANDOM Access FILES

This utility is a ram resident extension to the LKdos operating system and lets you create, read from, or write to very large data files kept on disk. It uses the commands OPEN#, CLOSE#, PRINT#, INPUT#, and INKEY$# to access the files from BASIC. There is also a high speed search command for finding a text string within the data file. Using the TAB command, you can randomly access directly any record in a file.

The utility is easily used within your basic programs and has a lot of uses, from storing large data files, creating large spell checker dictionarys or even converting you basic programs to an ascii text file .

This utility lets you take the limits off of the data capacity of the 2068 .Files on disk can be huge !

A simple data base program is included on the disk to demonstrate the utility.

PRICE: $ 15.00

Coming Soon from Larken Electronics

** The Larken Desk Top Publisher ** Produce high quality printing (like this page) with an epson compatible printer and LKdos. The entire HI-res graphic page is kept on the disk and scrolling though the page is as easy as clicking the joystick or mouse on the icon type menu. Text and Graphic editing with multiple sized fonts will also be featured.

** Spell Checker for Tasword and M-Script ** This utility program will let you have your wordprocessor text files be checked by a 350K dictionary.

All Prices $US - Specify type of drive when ordering.

LARKEN ELECTRONICS RR#2 NAVAN, ONTARIO CANADA, K4B-1H9
(613)-835-2680

RUMINATIONS FROM THE QL EDITOR

1990 promises to be the best year yet for the QL. There are lots of new hardware and software products. Many serious QL users will buy hard disks. 24 pin printers are catching on. The Panasonic KXP-1124 (about $300) seems to be the most popular choice. The book *QL Superbasic - The Definitive Handbook by Jan Jones* is available again through QUANTA. I highly recommend it. On the software front there is a new PC Emulator, PC CONQUEROR, by Digital Precision. We will be checking out in detail starting in this issue. Many QL users have already bought it and others are wondering if they should. The whole QL/PC connection is going to be covered extensively in UPDATE. TEXT87 continues to evolve as an alternative to Quill having many more extra features for those with 24 pin printers. I just released *CHAOS BUSTERS* described elsewhere in this issue. There is a lot of interest in this utility software area. After all, this mess on our desks was created by the computer. We need the power of the computer to tackle it.

I just received the farewell issue of Quantum Levels. It hurts us to lose such a techically competent magazine. I'm impressed that all funds due the subscribers are being refunded. We certainly owe a lot to Tom Bent, Jeff Moore, and Basil Wentworth for their hard work and high standards. We hope that they will continue to play a role in Sinclair Computing with the QL. In the New World, Update seems to be the only magazine left reliably providing serious coverage of the QL. Since you are reading this you are probably a subscriber, but you can try getting other QL users to you know to subscribe. It is critical for us to feel a demand in the coming months to insure that UPDATE will continue to be published.. Also, we each should support as many user groups as we can and become members of SNUG. If we fail to keep our main communications trunk alive we will all wither on the branches. Even with all its quirks the QL is a remarkably capable computer and it has many useful years ahead.

In this issue of Update we master PRINTING with QUILL. This is an area of immense confusion but Peter Hale guides us through how to configure the Quill software for printing. Next issue Bill Jones will explore the subject in more detail. Also in this issue I will explore plotting curves with EASEL, Bob Hartung will review PC CONQUEROR. He and Bill Jones will explore the concepts of Disk Operating Systems. Dave Youngquist reviews FLASHBACK and gives us a Superbasic program to put Directories in a file suitable for import to Flashback. Tim Stoddard provides the first part of a much needed User Guide for the Trump Card.

Next issue continues David McCall's series on Windows and another part of Tim's Trump Manual. I will begin reviewing PC verisons of the PSION suite with my Amstrad MS-DOS portable. 1990 should be a good year! Bill Cable.

SINCLAIR QL ISSUE DISKS (MDV)

The following new issue disks are offered for QL systems of all configurations. The programs are on either 80 track Diskette or MDV cartridge. If ordering for MDV send a formatted MDV cartridge. All prices are $22.00 (post paid) and are guaranteed to satisfy.

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1. "HARTUNG COLLECTION" DISK

Address and QSO file managers, plus a raft of disk utilities. All in Superbasic. Lots of tricks and hints for the programmers. Requires some knowledge of Superbasic or a yen to learn.

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2. "FENG QLUTer" DISK

QLUTer - QL UTilities to un-clutter your disks and tapes. COPY, DELETE, FORMAT, PRINT, VIEW functions. TURBO compiled for SPEED. Multitasks and minimal key press. Also has-- SNAP SHOT - a directory column or condensed print out program. ALSO includes "VEGEMAT" - a CLONE making program.

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3. "FENG QLUSTer" DISK

QLUSTer - very similiar to QLUTer (above) but has extended functions using some SUPER TOOLKIT II features. You must have the Toolkit (TK2_EXT) for this program. SNAP SHOT and VEGEmat also included.

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4. CABLE ARCHIVE DISK

ARCHIVE utilities and exensive doc file instruction manuals. Programs are: REFIELD, SCAN, SPLIT, JOIN, DIR, FILER, FREQ. For Beginner to Advanced user. These programs GREATLY EXTEND the capabilities of ARCHIVE and the manuals lead one to complete understanding of Archive and these extensions.
If ordering for MDV send two mdv cartridges- too many programs to fit into one cart.

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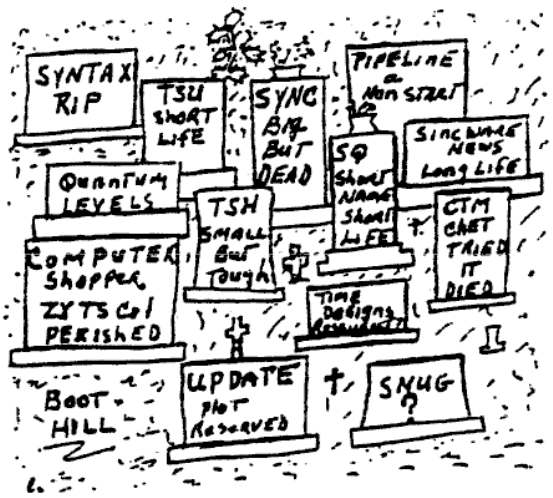
5. "CABLE HELPER2" DISK

A very useful TOOLKIT program for managing both DISKS and MICRODRIVE. HELPER lets you copy from one medium to another, Read or Copy doc files to paper or screen, repeat format mdv carts or floppy. Uses screen windows to see two directories from and to, copies over existing files in disk mdv, copy selected files. Does not conflict with TK2.

Order to UPDATE Magazine, address on cover. Check or money order accepted.

SINCLAIR TIMEX PUBLISHING PICTURE



The Boot Hill of Sinclair publishing has more stones than I thought until I began reminiscing. I subscribed to those listed from their first issue until their demise. These magazines taught me how to use the ZX80, ZX81, TS1000, TS2068, and the Sinclair QL. They also sponsored a sense of camaraderie and cooperation amongst Sinclair and Timex users and their supporters that has not been equaled. I think that the Olsen family who published SYNTAX likely can be credited with starting this traditional spirit of S-T users in North America. Fred Nachbaur, a Canadian who founded Syncware News, also had a lot to do with building the spirit of this unorganized but cooperating group of users in two great Countries. We ignored boundaries in our quest for education and hobby computing. Each successive publisher has contributed greatly to continue a communications link across the great distance from the Arctic to the semi-tropic and the Atlantic to the Pacific between Sinclair Timex users and their supporters. Most of us cut our "computer teeth" with these magazines. We also owe them our thanks for providing the media to allow entrepreneur designers to reach us with needed software and devices that have enhanced our computing abilities.

This era of Sinclair Timex publishing is about to come to a close. Update seems to be the last survivor and the subscription support is insufficient to allow continuance beyond this subscription year. The issue year ends with the July issue, which will be the closing issue.

My own part in the publishing scene has been enjoyable, but a lot of hard work. Subscriptions never reached the level that would allow the hiring of even a typist, and the magazine collating has been by hand. The writing part has been the easiest. Copying and assembling 30,000 to 50,000 pages by hand (to save a buck) is not the way that most magazines are published. I believe that you will understand when I say that I have reached the "burn out" stage. And I hope that this will also help all understand why the publishers of SyncWare News and Quantum Levels made their decision to close out.

SNUG MAY BE THE LAST DEFENDER OF THE FORT

Last year I offered "Update magazine on a platter" to SNUG. I am publically renewing this offer to SNUG for them to take over publishing Update as the SNUG publication with the October 1990 issue. At last report SNUG had around 130 members most of whom are subscribers to Update. The result of SNUG taking Update and continuing would be a FOUR FOLD increase in SNUG membership and a better chance for them to succeed in accomplishing their goals. I would invision SNUG trimming Update to about 30 pages, which would provide a modest profit to help support some of their other goals. Once Update discontinues publication this chance will be lost forever. Also lost will be the communications link between most of the active Sinclair users and their supporting programmers and suppliers. Once this link is lost it will be practically impossible for SNUG to build itself into a viable group. In fact, it just wont happen.

The two remaining issues of Update can be used by SNUG to announce their intentions and to encourage folks to re-subscribe. I believe that SNUG has the responsibility to accept this offer and prevent publication support from expiring.

The most important need that SNUG can fulfill is the continuance of publication support. The alternative is obscurity. SNUG is a non-profit organization operated by volenteers. Sinclair Magazine publishing for the past five years has also been non-profit, but accomplished by "single volenteers". If we could do it singly then SNUG can do it as a group organization. It is now time for SNUG to progress from the talking stage to the doing stage and to fulfill their chartered obligations.

My view is that SNUG needs courage and vigor from their staff to gain volenteers and participation by the users. That, and SNUG's success, can only be achieved by continuous publicity and a steady "sell job" in their own publication. Now is the time for SNUG members to write and give guidance to the SNUG staff about this important need. And, that is how it is for the future support of Sinclair Computing in North America (as I see it). Bill Jones

TS-2068 Activities

How Goes It?

There are now three predominent Disk systems for the TS-2068. Their order of usage is: LKDOS, Oliger SAFE DOS, TOS, and Aerco FD-68. TOS DISK users hang in there with determination but receive little support. User activities during 1989 has been away from the Aerco FD-68, mostly toward LKDOS. Quite a number of FD-68 users have acquired the LKDOS system and have abandoned the un-completed Aerco system. The FD-68 was my first Disk System and I did a lot of programming with it. The first Disk version of my "Smart Text" sofware was produced for the FD-68. I became dis-enchanted with the FD-68 when its high power usage fried two of my computers. Dan Elliott has the solution to that problem, but the solution came after a lot of users had fried their computers and gone to a different computer. It appears that few FD-68 users remain except the "CP/M Hacks".

There still remains a nucleus of FD-68 users who are dedicated to CP/M usage, which is really the strongest asset of the FD-68. These CP/M users are very self sufficient and specialized. As to the DOS itself, Aerco never did finish the source code to enable the most useful extensions, such as the Numeric and Character Array SAVE/LOAD and other features that LKDOS and Oliger DOS have. In its incomplete state the FD-68 DOS is far inferior to both LKDOS and Oliger DOS, and it is no wonder that the users have become disenchanted, especially when AERCO is so slow and un-cooperative with user support.

There has been little participation in or call for ISSUE DISK support in the FD-68 area, so little that UPDATE will discontinue the issue disks for the FD-68. If a sufficient number of complaints about this action are received, which indicate a demand, this decision will be reversed. I have two of the FD-68 systems and will be glad to resume work with the FD-68 if there is a demand revealed. So, all are invited to COMPLAIN LOUDLY.

A good many Oliger DOS users have also moved into LKDOS, keeping their SAFE system and using BOTH systems together. Update began "heavy on SAFE", then during 1989 became "heavy on LKDOS". Of the two, SAFE DOS is faster. Both systems have good EXTRA BASIC functions but LKDOS has more functions, notably the screen window group and Sequential Files. Update will try to keep up the Issue Disk Program Library for both LKDOS and Oliger SAFE DOS. But user participation is needed to maintain Disk Software Support.

DOS SYSTEM SUPPORT

Quite a lot of NEW Software and Utilities for Disk Systems have been introduced during 1989. Most of the new programs have been generated by Update Magazine for the two systems, The Toronto TSUG for LKDOS, and Larry Kenny himself for LKDOS. Larry has an outstanding "Sequential Files Manager" on disk, and is about to release a Desk Top Publisher and a Spelling Dictionary. Jack Dohany has kinda made a career out of updating MSCRIPT. Now he is working on improving a British Word Processor. TASWORD and MSCRIPT seem to continue as the "Most Used" word processors, with Smart Text being third. Update Magazine (Yours Truly) came in during 1989 with "Daisy.B6", a new concept in TS-2068 software. This Daisy program is a big expansion of the earlier Smart Text. The Daisy Software is about 80K in program length and uses MERGE extesively to boot in program utilities as needed. It can do so many things that it defies discription. Principally Daisy is a massive Data Base program, supported by its own Word Processor. Daisy has undergone the acid test. I use it for half or more of the publishing of Update Magazine because I can do such good formatting with it. Why would I do that when I have a Sinclair QL and its good Data Base and Word Processor? Well, that speaks for the Daisy software, doesn't it? And, I can create the data files to disk, many pages, and then order up the printing in one consecutive print run.

The Smart Text software does most of the above, but Daisy can handle much larger text bases in memory before a SAVE is required- about 20K or 5-8 pages. Both Daisy and Smart Text can use Mail Files to print letters to several hundred persons on a consecutive print run- all addressed and perfectly formatted- even to the signature line! And both have a Mail Merge annex to create their own mailing lists.

1988-89 also brought in other disk software, such as Bob Mitchell's View Calc for LKDOS. Bob's VC made me buy View Calc on cassette from RMG ($9.95). Imagine that! An up-scaled DOS user buying a cassette software! I did it to be legal using the View Calc Code. Once I loaded the code from cassette the trash can got the cassette. Actually I was already a bonafide owner of VC, but the program was purchased back in 1864 during the Civil War. The tape was so old that it broke when I tried to load it. That brought on a project of rumaging through about 250 old cassette programs, and you know what? I found that that mountain of Cassette programs was just so much junk! About the only programs that I kept was the "Hot Z" series. The trash can got the rest.

And there are some TS-2068 DOS users who are still trying to make do with their old cassette library! Anyone who spends 200 smackaroos for a Disk Interface, then 200 more skins for disk drives, and is willing to use cassette based software, is kinda wierd. Anyway--

1988-1989 brought on other good DISK SOFTWARE. "Mail Merge", a RECORD data base software, was introduced by Update Magazine.

The Mail Merge software creates a group of records like Mailing Lists or inventory records, then prints them out to paper or to labels. Mail Merge also creates "Outlines" for that type of need. The Outline data base is flexible and can be set up for any number of topics and any number of sub-topics of each. Such records can be endless, as the software manages the files in and out of disk drive. Mail Merge also has a very flexible print out with either a full size printer or the TS-2040. Letter head stationary

is also a print product, as well as Labels or listings to paper.

Another outstanding set of DISK MANAGEMENT UTILITIES for the Oliger DOS was introduced by Update Magazine. Bob Hartung is the author. This "DOSDEX" utility disk manages Oliger DOS Disks to a perfection. A similiar set of utilites for LKDOS is available from the Toronto, Canada TSUG.

More good software and utilities will come this year. I'm working on "Dbasel", a huge update to the Mail Merge program. It appears that this program will be able to Sort by any line of the records- by first group or last group within the line. Also it will sort any number of files IN DISK. Then we'll have the capability to create and sort any size of a continuous file- say 10,000 Mailing List records, by last name or by Zip Code- or a similiar large inventory file sorted by stock number or part name or re-order level!

TS-2068 DOS users have it pretty lucky with so much NEW software and utilities available. It would be neat if more users would take advantage and buy some of the good stuff. That would encourage the programmers to keep on working. By the way, try doing a similiar print out as these two pages are formatted with your word processor. This is done with the Daisy.B6 software.

The Update TS-2068 Disk Library

The following Disk software and utilities are offered. The individual disk listings are given by TYPE of DOS that the disks are prepared for.

The disks are available on 5-1/4" Double Side Double Density Diskettes, either 40 Track (360K) or 80 Track (720K) disk drives. If you have a 5-1/4 inch disk drive these disks will work in your system. Each disk has at least 300K of programs and utilities. The price is $22.00 per disk (postage paid) (add $1.00 to Canada). Checks or Money Order.

DAISY.B6 : A Complete TS-2068 Software System, Data base management, Word Processing, Automatic formatting, Disk Management. Over 20 integrated programs, including a Mail Merge annex. For LKDOS Only. (Oliger DOS users order Smart Text.) An Update Magazine Software.

SMART TEXT : A versatile Data Base and Word Processor software. Includes a Mail Merge annex to create mailing lists for automatic repeat letters. Label printing, Disk Management. By Update Magazine. For Oliger DOS Only.

DOSDEX : A set of DISK MANAGEMENT programs for the OLIGER DOS. By Bob Hartung.

VIEW CALC UPGRADE : The old PSION View Calc program Expanded and Converted for LKDOS with Spread Sheet Printer. By Bob Mitchell. For LKDOS Only.

1988 UPDATE COLLECTION: The Mail Merge Software plus the disk filled with utilities. For LKDOS or Oliger DOS

1989 UPDATE COLLECTION: Filled with all of the utility programs published during 1989. LKDOS or Oliger DOS

SMART TEXT 64: (Coming) Smart Text software in 64 Column Screen for use with the Zebra OS-64 Cartridge. For OLIGER DOS ONLY. (Do not order until release is announced)

DBASE-1 : (Coming) A new RECORD software. The data base will be very flexible with applications for Mail Lists, Inventories, or just about any purpose one needs. Sort by any line, and by first or last group within the line. A "Sort Disk Files" feature will allow one to create and sort thousands of continuous records. (Do not order until release is announced.)

1990 UPDATE COLLECTION: All of the Utility programs being published during this current year. (to be released in Oct.)

PUBLIC DOMAIN PROGRAMS: Update has literally hundreds of public domain programs, likely as large a collection as exists. Most have bugs of one sort or another. In comparison with the above DISK SOFTWARE the PD programs are miniscule, but some can be made into snappy "single purpose" utilities. If interest is expressed we may do some De-bugging and conversions of these PD programs and re-release them in groups of 5-10 programs for both Disk and Cassette. We haven't done anything with PD in deference to SNUG and some TSUGS who have PD Libraries. What do you think?

NOTE TO PROGRAMMERS: YOU can join in with the Issue Disk Program. All you need to do is to write a "Mini-Manual" for your software to be published, and supply the disk.

BACK ISSUES OF UPDATE MAGAZINE are available in YEAR Groups for $18.00 per year (post paid) (add $1.00 to Canada) Each year group has over 200 pages of mostly useful programs and utilities as key-in projects and MANY Tutorials for Basic and MC programming. Available are:

1988 Year Group (All TS-2068 Supportive)

1989 Year Group (TS-2068 and Sinclair QL

TWO MAGAZINES DEPART WITH CLASS

An Editorial

The Final Issue of Quantum Levels - SyncWare News came in the Jan. 1990 mail. The publishing group held the two magazines together for the longest duration of any Sinclair Timex magazine. The principles are: Fred Nachbaur, Thomas Woods, Tom Bent, Jeff Moore, and Basil Wentworth. Update salutes the publishing group of these two fine magazines for their seven years of service to Sinclair Timex Users. Update, I believe, speaks for the entire S-T user group in expressing appreciation for their individual efforts. AND, the group went out with CLASS! Every subscriber is to receive pro-rata refund of un-filled subscription.

For those who have not been subscribers to SYN or QLs let me say that there is an exceptionally good Data Base of instructional articles in the issues of these two magazines. Syncware News covers the TS-2068 and TS-1000, and Quantum Levels the Sinclair QL. If you do not have the magazine issues that pertain to your computer NOW is your LAST CHANCE to enrich your library with valuable information about your computer and its programming.

Good books deserve to be used. Because of the value and in appreciation for past service, Update Magazine devotes the next three editorial pages to a listing of the SWN and QLs issues that are available to you on a - LAST CHANCE - Never to be Repeated - offer. These two magazine volumes are CLASSICS! They may be ordered by single issue or by any number of issues. Get your missing issues before it is too late.

Now Including SyncWare News!

Quantum Levels

FINAL EDITION

vol. 2, no. 6

TIPS AND TECHNIQUES FOR QL COMPUTERISTS

FINAL FAREWELL ISSUE!

Quantum_Levels and SyncWare News to close doors for good.

With this issue, the 1980's Era of Computer Discovery comes to a close. Sad, but true. See 'From The Publisher's Desk...' inside for the complete details.

SyncWare News and Quantum_Levels Back Issues

Most issues of SyncWare News and Quantum Levels are still available. The cost is $3.00 per issue except where otherwise indicated. The cost includes postage and handling. We will continue to fill orders for back issues until December 31, 1990 or until our supply is exhausted. Please include a second or third choice when ordering, as this saves us the cost of writing a check for a refund should we be out of the issue you want.

SyncWare News Back Issues...

Volume 1 Everything you wanted to know about the TS1000 or ZX81 but were afraid to ask! Products, cassettes, LPRINT hints, hardware projects including video, back-up batteries, and joysticks, TYD*BYTES, and Linear Simultaneous Equations. **110 pgs.**
$5.00

SWN Volume 2 No. 1 Forum column begins, TS2068 BASIC, TS2068 ROM Calls, FORTH, TRANSLATIONS, BASIL'S COMPENDIUM - Z80 Machine Code Tutor column begins, TS1000 Oliger Video Upgrade Part 1. **20 pgs.**

SOLD OUT

SWN Volume 2 No. 2 Decimal to Hex and Back, SAVE/LOAD Utility, MEMOTEXT in RAM, PEEK, POKE, and USR...,REVIEW: Timex Sinclair Intermediate Advanced Guide, TS1000 connects to outside world, Relocatable MC, Oliger Video Upgrade, Part 2. **24 pgs.**

SWN Volume 2, No. 3 REVIEW: Spectrum Compatibility & the 2068 ROMSWITCH, REVIEW: Skyplot & Celestial BASIC, REVIEWS: Hall of the Things, Manic Miner, Jet Set Willy, and Lunar Jetman, 2068 Cassette Connection, 2068 Character Builder, FORTH, 2068 Bank Switching, Decoding the EPROM, Add RAM to the 2068, Basil's Compendium. **24 pgs.**

SWN Volume 2 No. 4 TS1000 Fast Screen Clear, REVIEW: TS1000 Plane Frame, 2068 Word Images, Basil's Compendium, 2068 Art, Build your own EPROM programmer, Part 1, TS1000 Banner, FAT Mscript. **24 pgs.**

SWN Volume 2 No. 5 Initial QL Review, More 2068 Cassette Connection, ZX81 MC in high memory, 2068 Quick Screen Display, EPROM Programmer, Part 2, Basil's Compendium, Off the Wall, REVIEW: Uploader 2000, REVIEW: Appointment Watch, Customize Your Mscript, TS1000 Move It, 2068 Print Command Compiler. **24 pgs.**

SWN Volume 2 No. 6 Adding on to the Gladstone 64K, TS1000 Universal Printer Driver, Building a 2068 Database, Part 1, Expanded 2068 INPUT prompts, REVIEWS: Astronomical Software 1 and Planet Finder, QL SuperBasic, Basil's Compendium. **24 pgs.**

SWN Volume 3 No. 1 Bug Alert, TS1000 LO-RES, 2068 64 column BASIC, Put 2068 Machine Code in a DATA statement, TS1000 Audio Frequency Counter, 2068 Database, Part 2. **24 pgs.**

SWN Volume 3 No. 2 Become a Sinclair Tycoon, One Chip Mods...Decode Your Byte Back (TS1000), REVIEW: YS Megabasic, 2068 Curve Tracing, TS1000 REM Generator, Read a 2068 Header, TS1000 Game - Fast Times At Clairmont High, Atomic Fusion EPROM Eraser, Amazing 2068 PIX FIX. **24 pgs.**

SWN Volume 3 No. 3 Off the Wall, Tri-Base Arithmetic, 2068 Lotto, REVIEWS: Checkrec and Household Inventory 2000, GET: A TS1000 Input Routine, One Chip Mods: Recycle That 16K RamPack!, Basil's Compendium, Bug Alert, REVIEW: Hot-Z/Zeus Comparison, Dice 1000, 2068 Screen Copy Routine, TS1500: More than meets the eye. **24 pgs.**

SWN Volume 3 No. 4 Basic Bank Switching, 2068 Buggy Software, ZX81/QL Regulator Bug, 2068 Tower of Brahma, 1000 Auto Analysis (AI on the TS1000), Upgrading MTERM, The Fame and the Glory-Contest Honor Roll, TS1500 Hi-Res, Send a 2068 Message. Special April Fool Issue. **24 pgs.**

VIEW: War In The East, REVIEW: Concept 3D. **16 pgs.**

QL Vol 1 No. 2 Q_Tips: Solve those power problems, COMMAND POST: SIN, SQRT, and other commands, SuperBASIC Corner: Procedures and Functions, Investment Analysis - Abacus Application. **16 pgs.**

QL Volume 1 No. 3 Q_Tips: SAVE & LOAD, ICE vs. DESK: A Comparison, Simulating "VAL", Build a Micro Drive Storage Box, Exploring SuperBASIC - Mandelbrot Plot, Part 1, SuperBASIC Corner: LOOPS & BRANCHES. **24 pgs.**

QL Volume 1 No. 4 Condensed High Speed Graphics, Mandelbrot: Part 2, GPRINT: A BASIC Screen Dump, Star Cluster, SOFTWARE REVIEWS: Keydefine, Taskmaster, and TAXIQL. **16 pgs.**

QL Volume 1 No. 5 Q_TIPS: A Battery Backed Clock, Exploring SuperBASIC, Overseas Software: Where To Get It?, Introduction To ARCHIVE, Part 1, SuperBASIC Corner: IF/THEN/ELSE/ETC., DEF_TMP: What it is. **16 pgs.**

QL Volume 1 No. 6 Q_Tips: Decode Your ROM, Three Game Reviews: Match Point, BJ in 3D Land, & Karate, Exploring SuperBASIC, Playing with Electricity, SUperBASIC Corner: FILES, TURBO vs. LIBERATOR. **16 pgs.**

QL Volume 2 No. 1 QL AutoDir: A Front End Loader, CP/M on the QL: A Review, Introduction to ARCHIVE, Part 2, How the QL Handles Strings: A Tutorial in String Comparison, XREF: A Review. **16 pgs.**

QL Volume 2 No. 2 Q_TIPS: Enhancing your QL keyboard, Adventure Writing, Part 1, Paste Art Review, Q_TIPS: RGB output woes and fixes, Playing With Electricity, REVIEW: Ultrasoft's QKICK. **16 pgs.**

QL Volume 2 No. 3 A First Look At Sinclair's New Z88, Q_TIPS: ROM Board Revisited, Adventure Writing, Part 2, Network Your QL's, ONE_LINERS, Programming By Procedure, A Date Printing MC Routine. **16 pgs.**

QL Volume 2 No. 4 ONE_LINERS, Q_TIPS: Common QL problems and their fixes, SPEEDSCREEN vs. TURBOQUILL+, Playing With Electricity, Printing From Quill, Adventure Writing, Part 3. **16 pgs.**

SyncWare News Combines With Quantum_Levels

QL Volume 2 No. 5 Eying The QL, The Solution: An IBM Emulator for the QL, Programming by Procedure, Playing With Electricity, TRA_BAS 1.1: RS-232 Translation, To MG or not To MG. **THE SyncWare Pages:** 2068 Custom Tape/Disk Directory, Fractions, TYD*BYTS. **24 pgs.**

QL Volume 2 No. 6 - The Final Issue. This is the issue you are currently holding in your hands. At the time this is being written, the only thing I know for sure it will include is this list. **16 pgs.**

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QUANTUM LEVELS BACK ISSUES...

QL Volume 1 No. 1 The American QL: A Peek Inside, QL Circuit Board Layout and Parts List, Composite COLOR on the QL, Inside SuperBASIC: Tip No. 1, Stopping Black Screenitis, RE-

WOOD AND WIND COMPUTING

Bill Cable : RR 2 Box 92 : Cornish, NH 03745 : 603 675 2218

Cable Column

I was pleased to see that in the October & November issues of QL World they gave considerble space to *ARCHIVE*, the PSION database program we all have. Those of you who have followed this column know that I have high regard for ARCHIVE and have tried to promote it use by more US QL users. Its programming language is what I do most of my QL software development in. If you are not using a database or running database type programs you are missing out on a lot of what your QL can do for you.

Below we will examine the PSION program *EASEL* as it can be used for plotting mathematical curves. All QL users should be able to do the example even if the are using a TV as a monitor. If you have never used EASEL give it a try.

PLOTTING CURVES WITH EASEL (Business Graphics)

Easel is the most fun of the PSION programs to play with. EASEL is a very easy to use and powerful graphics program and the QL is a flexible graphics computer. In fact the QL version of EASEL has better graphics than PSION's PC version of EASEL on a 286 with VGA graphics. Besides simple bar and pie graphs as described in the manual EASEL can be used to plot complex mathematical equations. Multiple curves can be plotted on the same graph to see if they intersect (have solutions). This easy graphical intepretation of equations enables one to solve equations in a couple of minutes that would othewise require fancy software. I realize that most readers don't need to solve equations but most of us have some interest in math. Its fun to doodle with formulas and watch the curves appear on the screen and its so easy to do with EASEL. Anyone taking a math course will find EASEL a real asset. Graphical interpretations in mathematics often gives insights that are hard to come by otherwise. No need to buy more software or write a SUPERBASIC program. Just follow the suggestions below and you will be plotting curves in no time.

In the examples below I use EASEL version 2.1 as it comes set up for microdrive. You can use your PSION config_bas program to configure EASEL for floppies if you have them and substitute flp references where I use mdv. First I will give a quick overview using EASEL for curve plotting and then a 2 step tutorial with key presses in bold face. Be sure to refer to the manual for more detailed descriptions of the commands and concepts.

Overview of EASEL

Easel works very much like the other PSION programs. There is the help box at the top giving us instructions and informing us of the various commands avaiable. Pressing <F1> always gives us help. Pressing <F2> makes the upper description boxes go away or come back. There are 2 modes, data and formala entry mode and command mode. Pressing <F3> puts us in command mode. Pressing <ESC> cancels commands or input and eventually puts us back in data entry mode. When in data entry mode if we type a number it is interpreted as raw data to go in the current cell and if we type alphabetic characters they are interpreted as a formula to be calculated for all cells. Trying to do a command when in data entry mode or trying to enter data or a formula when in command mode are easy mistakes to make. Just look at the lower left of the screen where the input line is. When in data and formula entry mode you will see '?' and when in command mode you will see 'COMMAND> '. Use <ESC> to cancel mistakes or switch to data input mode and <F3> to switch to command mode.

Easel is always working with a set of data each of which consists of a location (cell) on the horizontal axis (x axis) and a corresponding numeric value up the vertical axis (y axis). EASEL can work with more than one set of data and so each set needs a name. When you first start up a set called 'figures' is defined. If you define a new set of data 'x' and type in the formula y=sin(x), EASEL uses the name on the left side of the equal sign,y, to be the name of a set of data to be calculated from what is on the right hand side of the equal sign, sin(x). Easel would create the new set of data, y, where each y would equal sin(x) for each x. If the set of data, y, had already existed then each would be recalculated by the formula. Even if more than one

curve (set of data) is on the screen at once there is just one active one. You can tell which one it is by seeing what follows the 'Current Name' label at bottom of screen.

The horizontal axis is divided into cells. When you first start up there are 12 cells for the months of the year. You can move around the cells with <TAB> and <SHIFT-TAB> and if you move beyond either end EASEL will rescale and add more cells. For simple bar graph applications labels are important for cell identification on the horizontal axis but for mathematical applications the cells will correspond to numbers on our horizontal axis (x axis) and we don't need labels. In fact we rescale the horizontal axis to have so many cells that there is no room for cell labels.

EASEL provides two special terms to use in formulas that allow us to scale the horizontal axis to our needs. They are *cellmax* (equals the value of the total number of cells in our current scaling) and *cell* (ranges from 1 for left most cell to cellmax for right most cell). If we scaled our graph so it had 100 cells then cellmax=100 and cell ranges from 1 to 100. If we define a set of data,ref, by the formula ref=(cell-1)/(cellmax-1) then ref always ranges between 0 and 1 no matter what our cell scale is because cell ranges between 1 and cellmax. Then if we wanted to plot a sine curve in the range -2 to 2 we can set our independent variable x as x = -2 + 4*ref. So x ranges between -2 and 2 as ref ranges between 0 and 1. Then plotting y=sin(x) will give us our sine curve in the range -2 to 2. Note that if you have a mistake in a formula you will get the message 'formula gave no values'. You can then use the arrow keys to edit the formula.

If the graph is bar graph we can change it to a line with the Change (line) command. We can pick which of our currently defined sets of data we want to see with the View command. We can edit the text on our graph with the Edit command. If there is an area of the graph of interest to us we can use the cross hairs (controlled by arrow keys when in data entry mode) to read the values off the vertical axis. Getting values off the horizontal axis is not directly possible since the values for x are not labeled. The best way I have found is to display the curves of interest plus x (our independent variable) with the view command. Then use the Files (export) command to export the data to a file. The file can then be viewed,printed or imported to ABACUS so the actual values can be read directly.

USING EASEL

Dig out your EASEL (Business Graphics) cartridge and have a another formatted cartridge ready to hold your data. Have all cartridges removed from your QL. Reset your QL and put your copy of EASEL in mdv1_ and your data cartridge in mdv2_ and press <F1> (or <F2>). Easel will load and you will see a graph with the months of the year along the horizontal axis. If you type in numbers then they will be put in the corresponding months.

STEP 1 : Making a master graph for curve plotting

You need do this step only once because we will save the result to a file called 'curves_grf'. Anytime you want to plot curves you just load 'curves_grf' and start at step 2.
First lets remove the months from the horizontal labels. We will use the edit command.

<F3> switch to command mode

e edit command

l edit labels

<F4> delete labels

(do <F4> 12 times to delete Jan through Dec)

(note after Dec was deleted the graph rescaled its horizontal axis)

Now let us make 100 cells on our horizontal axis

<ESC> exit edit command

<ESC> exit command mode to data entry mode

<TAB> move toward end of graph

(do many,many <TAB>s until graph rescales 4 times)

We should have 5 total rescales (1 in edit mode, 4 in data entry mode). This makes 100 cells. If you go too far then <F3>v<ENTER><ENTER> and <TAB> through 5 rescales. The examples do not depend on the how many cells we have scaled but up to a point the more cells the better the plot resolution.

Now let us edit the graph title

<F3>et command mode,edit command,edit text (move the cross hairs (with arrow keys) to the 'T' in Title)
<ENTER>

(Delete 'Title' with <CTRL> up arrow and enter :)

Plotting Curves<ENTER>

(move new title where you want it with arrow keys)

<ENTER> exit edit text

Now let us change the graph paper to remove all those vertical lines

cg5<ENTER> change graph paper to format 5

Now let us define our 'ref' set of data that we will always use to define the range of our independent variable x. Ref ranges from 0 to 1.

<ESC> return to data entry mode

ref=(cell-1)/(cellmax-1)<ENTER> formula to define ref

<F3>cL2 change ref to line style 2

Remove the initial set of data 'figures' as we won't use them

<F3>k kill command

figures<ENTER> kill the 'figures' data set

Now save our master graph

s save command

curves<ENTER> put on mdv1 and call curves

STEP 2 : Plotting 2 curves

Let us plot 2 curves to see if they cross (a solution y=w):

```
y = x*x*sin(x) + x -1          x between -5 and 5
w = x*x - 4*x -1
```

First lets load our curve plotting master graph. You saved it right?

<F3>L load command
curves<ENTER> load curves grf from mdv2

Set up x scale. We have already defined ref

<ESC>x=-5+10*ref<ENTER>	define x so it goes from -5 to 5
<F3>cL2<ENTER>	change x to a line graph style 2

Now plot y and w

<ESC>y=x*x*sin(x)+x-1<ENTER>	enter formula y
<F3>cL0<ENTER>	change to line style 0
<ESC>w=x*x-4*x-1	enter formula for w
<F3>cL1<ENTER>	change to line style 1

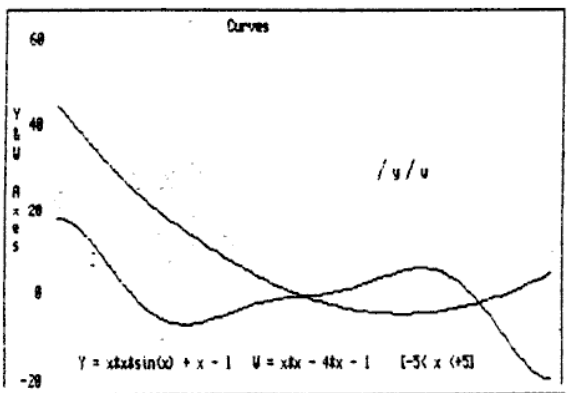
Now see how they look together

<F3>vy,w<ENTER><ENTER>	view y and w data together

We see that there are 2 points where they intersect and there may be more. We can rescale x to a bigger interval and enter the y and w formulas again if we want to check for other intersections. Return to the data entry mode with a few <ESC>s and move the horizontal wire with the up or down arrow key to each intersection. You will see that y or w equal about -1 and -2.5 at the intersections. You know that x goes from -5 and 5 on the horizontal axis so you can very roughly estimate it to be about 0 and 3 at the intersections. More exact values can be found by exporting. Typing : <F3>vx,y,w<ENTER><ENTER>fevalues<ENTER> will create an export file values_exp. It contains the data names in the first line and each following line has the cell label (null),x value,y value, w value. You can import it to ABACUS it or copy it to your screen or printer to inspect it.

You can print your curves also

<F3>vy,w<ENTER><ENTER>pp	view and print



A screen dump of the 2 curves as plotted by EASEL.

MORE FUN WITH EASEL

I have only just touched on EASEL and curve plotting. I hope you are inspired to explore further. *I recommend reading Warren Fricke's excellent articles on curve plotting and polynomials* (under the TS-2068 programming section) in the last 2 UPDATE issues (Jul 89, 20-21, Oct 89, 24-26). You can use EASEL to plot the curves he describes and you don't need to program. Be sure to use repeated multiplication for powers (x*x*x for x cubed, etc) in the formulas. Also the curves he shows have the axes rescaled for better resolution. Your graphs will have slightly different shapes but if you check the details you will see they are indeed the same curves.

Wire Frame Sprites with Magnification - By Larry Kenny

Using pattern tables to draw wireframe type characters is used a lot with the Apple II computers since they dont have sprites. This program uses letters stored in a string variable to draw graphics characters with a magnification parameter. The letters shown in figure 1 direct the drawing in 8 directions.

An upper case letter will move the pixel position and plot it. eg. if A$="RDLU" - a box would be drawn (right down left up). The LPRINT command preceeded by RAND USR 50000: is used to pass the parameters to the machine code routine. The syntax is: RAND USR 50000: LPRINT x$, magnification, x coord, y coord.

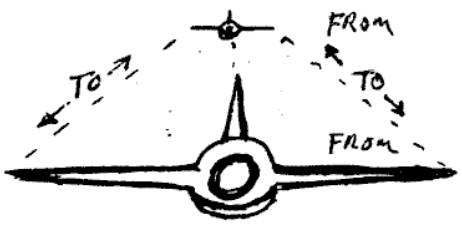
-x$= (or any string var) holds the pattern string.
-Magnify= 0 to 9 (10 to 19 will un-plot the same pattern).
-X coord= starting X coordinate.
-Y coord= starting Y coordinate.
- all parameters can be fixed numbers, formulae, or expressions. You can also have more than one character drawn in one LPPRINT statement by separating sets of parameters by semi colons.

Enter the assembly language programs using an assembler such as the ZEUS assembler (available from RMG Enterprises) and save ths source code file before typing in the Basic program. All numbers are decimal unless preceeded by #.

This program also demonstrates how to link BASIC lines and formulas to you own machine language programs. Using the ROM calls with TS-2@68 programming really simplify using formulas and finding variables.

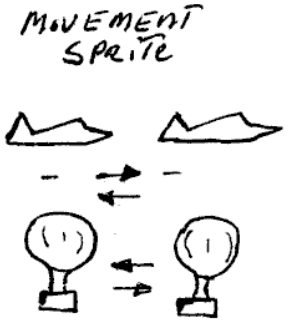
The Basic Listing is an example of using the wire graphics. Keys 5-6-7-8 move the character about on screen. Keys 1 and 2 reduce or magnify the character size.

A large variable size character set could also be made using this approach. If the character is to be moved about the screen, you can increase the speed by moving more than one pixel at a time.



U
X Y
L R
V Z
D

Figure 1




```
00001 ORIGIN 50000        ; Assemble code at 50000
00005 ;Wire Graphics  by LARRY KENNY  - LARKEN ELECTRONICS-
00010 Chadd EQU 23645     ; Current Char in BASIC being Interp.
00020 Start  RST 32  ; Move Chadd to LPRINT token in BASIC .
00030 Again  RST 32  ; Move Chadd to point to string variable.
00040        LD HL,(Chadd) ; Check to see if the variable
00050        INC HL        ; is a string variable by comparing
00060        LD A,36       ; the character after the variable
00070        CP (HL)       ; with a '$'.
00080        JR Z,String   ; Continue if its a '$'.
00090        RST 8         ; If not, stop with Subscipt-
00100        DEFB 2        ; wrong Error.
00110 String CALL #2C70    ; Rom call to search for Variable.
00120        JR NC,Vfound  ; Continue if the variable is found.
00130        RST 8         ; If not found, stop with error
00140
```

```
DEFB 1          ; Variable not found.
        00150 Vfound LD (Strad),HL ; Store address of string variable.
        00160        RST 32        ; Move 'Chadd' past the first comma.
        00170        CALL EVALU    ; Evaluate the Magnify parameter.
        00180        LD A,C        ; See if the magnify
        00190        CP 21         ; parameter is out of range
        00200        JP NC,Interr  ; if larger than 20 then Int error.
        00210        LD (Magni),A  ; Store Magnify parameter.
        00220        RST 32        ; Move Chadd past next comma.
        00230        CALL EVALU    ; Get the X coordinate.
        00240        LD A,C        ; Store the
        00250        LD (Coord),A  ; X coordinate.
        00260        RST 32        ; Move Chadd past last comma.
        00270        CALL EVALU    ; Get the Y coordinate.
        00280        LD A,C        ; Check to see if it is in the
        00290        CP 176        ; range of 176
        00300        JP NC,Interr  ; Jump to Integer out of Range Err.
        00310        ADD A,16      ; Adjust it for bottom 2 lines.
        00320        LD (Coord +1),A  ; Store the Y coordinate.
        00330        LD HL,(Strad) ; Get the Address of the String.
        00340        INC HL        ; Load the BC register
        00350        LD C,(HL)     ; with the length of
        00360        INC HL        ; of the String.
        00370        LD B,(HL)     ;
        00380        INC HL        ; Move the String pointer to the
        00390        LD (Strad),HL ; start of the data in the String.
        00400        LD A,(Magni)  ; See if the Magnify
        00410        CP 10         ; parameter is to erase or draw.
        00420        JR NC,Setpix  ; Go to set pixel setup
        00430        LD A,255      ; Set the mask to
        00440        LD (mask)


,A   ; draw .
        00450        JR Draw       ; Go to Main routine
        00460 Setpix SUB 10        ; Bring Magnify back into range
        00470        LD (Magni),A  ; of 0 to 9 and store
        00480        XOR A         ; Set the
        00490        LD (mask),A   ; mask to erase.
        00500 Draw   LD A,B        ; Main draw loop.
        00510        OR C          ; See if we are at the end
        00520        JP Z,EXIT     ; of the String.
        00530        DEC BC        ; Reduce lenth counter.
        00540        LD DE,(Strad) ; Load the current Letter
        00550        LD A,(DE)     ; into the accumulater.
        00560        INC DE        ; Point to next char in the string.
        00570        LD (Strad),DE ; Store the String address.
        00580        LD (Char),A   ; Store the current Letter.
        00590        LD A,(Magni)  ; Load the Magnify parameter
        00600        LD D,A        ; into the D register for
        00610        INC D         ; a loop counter.
        00620        INC D         ; Preset the counter.
        00630 Nextpx DEC D         ; Reduce the loop counter.
        00640        JR Z,Draw     ; Get next letter if counter zero.
        00650        LD A,(Char)   ; Get the current Letter.
        00660        LD HL,(Coord) ; Get the screen coordinates.
        00670        RES 5,A       ; Force letter to Upper case.
        00680        CP 85         ; If its a 'U'
        00690        JR Z,UP       ; then go to UP
        00700        CP 68         ; If its a 'D'
        00710        JR Z,DN       ; then go to down.
        00720        CP 90         ; If its a 'Z'
        00730        JR Z,RTDN     ; then go to Right-Down.
        00740        CP 86         ; If its a 'V'
        00750        JR Z,L


FDN     ; then go to Left-Down.
        00760        CP 88         ; If its a 'X'
        00770        JR Z,LFUP     ; then go to Left-Up.
        00780        CP 89         ; If its a 'Y'
        00790        JR Z,RTUP     ; then go to Right-Up.
        00800 RT     CP 82         ; If its not a 'R'
        00810        JR NZ,LF      ; then go to Left.
        00820        INC L         ; If 'R' then Inc
```

```
00830          JR Plot        ; Xlo it.
00840 LF       CP 76          ; If no 'L' then goto
00850          JR NZ,Badchr   ; Invalid Aroument error.
00860          DEC L          ; Dec X coord.
00870          JR Plot        ; Plot it.
00880 RTDN     INC L          ; Inc X coord and
00890          JR DN          ; and Dec Y coord.
00900 LFDN     DEC L          ; Dec X coord and
00910          JR DN          ; dec Y coord.
00920 LFUP     DEC L          ; Dec X coord
00930          JR UP          ; and inc Y coord.
00940 RTUP     INC L          ; Inc X coord and
00950 UP       INC H          ; Inc Y coord.
00960          LD A,H         ; See if the Y coord is
00970          CP 192         ; within range.
00980          JR NZ,Plot     ; If ok then plot it.
00990          LD H,0         ; If past the top, then
01000          JR Plot        ; start it at the bottom again.
01010 DN       DEC H          ; Dec the Y coord.
01020          LD A,H         ; See if the Y coord is past the
01030          CP 255         ; bottom of the screen.
01040          JR NZ,Plot     ; If ok then plot it.
01050          LD H,191       ; If so the start at the top again.
01060 Plot     LD (Coord),HL  ; Save the newly adjusted coords.


01070       LD A,(Char)    ; If the current Letter is lower
01080          BIT 5,A        ; case the dont plot to the screen.
01090          JR NZ,Nextpx   ; Go back to next command.
01100          PUSH BC        ; Save the String length.
01110          CALL PIXEL     ; Plot or Unplot the Pixel
01120          POP BC         ; Get the length back.
01130          JR Nextpx      ; Go back and do next command.
01140 Badchr   RST 8          ; Invalid Argument Error if the
01150          DEFB 9         ; letter isn't recognised.
01160 EXIT     LD HL,(Chadd)  ; Load the Chadd pointer into HL.
01170          LD A,(HL)      ; Repeat the complete Sprite routine
01180          CP 59          ; if a ';' is the next character.
01190          JP Z,Again     ; Go back to the beginning.
01200 RET                     ; if not return to BASIC.
01210 EVALU    CALL #1BE5     ; Rom call to evaluate the expression
01220          CALL #1F23     ; Rom call to put result in the BC reg.
01230          LD A,B         ; If the number is less than 256
01240          CP 0           ; then return with out an error
01250 RET Z                   ;
01260 Interr   RST 8          ; Interger out of Range
01270          DEFB 10        ; Error.
01280 PIXEL    LD BC,(Coord)  ;----------------------------
01290          LD A,191       ; This routine was in the 2068
01300          SUB B          ; technical manual. (page 122)
01310          RET C          ; It calculates the address of
01320          LD B,A         ; the coordinates and the pixel
01330          AND #C0        ; position.
01340          RRA            ;
01350          RRA            ;
01360          RRA            ;
013


70          LD H,A            ;
01380          LD A,B         ;
01390          AND 7          ;
01400          OR H           ;
01410          OR #40         ;
01420          LD H,A         ;
01430          LD A,C         ;
01440          RLCA           ;
01450          RLCA           ;
01460          RLCA           ;
01470          AND #C7        ;
01480          LD L,A         ;
01490          LD A,B         ;
01500          AND #38        ;
01510          OR L           ;
01520          RLCA           ;
01530          RLCA           ;
```

```
01540         LD L,A          ;
01550         LD A,C          ;
01560         AND 7           ;
01570         LD B,A          ;----------------------------
01580         LD A,(mask)     ;
01590         LD C,A          ;
01600         LD A,1          ; This routine creates a mask
01610         INC B           ; that will point to the
01620 Rotat   RRCA            ; pixel in the display file
01630         DJNZ Rotat      ;(byte.
01640         BIT 0,C         ; See if pixel is to be set
01650         JR Z,Reset      ; or reset
01660         OR (HL)         ; Set pixel in the display file
01670         LD (HL),A       ; by ORing it with result mask.
01680 RET
01690 Reset   CPL              ; Reset the pixel by inverting
01700         AND (HL)         ; and ANDing the result mask.
01710         LD (HL),A        ;
01720 RET


01730 Magni DEFB 00          ; Declare some room for Variables.
01740 Char  DEFB 00          ;
01750 Strad DEFW 0000        ;
01760 Coord DEFW 0000        ;
01770 mask  DEFW 00          ;
```

```
  1 REM > SPRITE GRAPHIC DEMO <
  5 PRINT "Use curser Keys '5678' to move"
  6 PRINT "Use Keys 1 and 2  magnify"
 10 LET p$="RRRVZZZVXXXVUUU"
 20 LET x=100: LET y=100: LET m=5: LET oldx=x: LET oldy=y
 30 RANDOMIZE USR 50000: LPRINT p$,m+10,oldx,oldy
 35 LET m=m-(INKEY$="1" AND m>0)+(INKEY$="2" AND m<9)
 40 RANDOMIZE USR 50000: LPRINT p$,m,x,y
 50 LET oldx=x: LET oldy=y
 60 LET x=x-(((INKEY$="5")*4) AND x>0)+(((INKEY$="8")*4) AND x<
250)
 70 LET y=y-(((INKEY$="6")*4) AND y>0)+(((INKEY$="7")*4) AND y<
165)
100 GO TO 30
500 RANDOMIZE USR 100: LOAD "Sprite.C1"CODE 50000: RUN
```

PASCAL for the TS-2068 and Sinclair QL

This little note from the Editor is to provolk thought. Quite some time ago David Solly, of the Ottawa Group, sent in a masterful large article about PASCAL. I was afraid to publish it because "I couldn't cope" with its advanced programming. Now we have in a following article a short and sweet program (done by David for Larry Kenny). This article may whet the appetite of many for PASCAL TUTORIALS. The article also ties in well with the next subject.

I believe that we should start at the foundation level with PASCAL. It is a very powerful language that we should learn. To David and other PASCAL programmers: Lets go with some beginner tutorials and lead into the power and speed of PASCAL. Most colleges teach Pascal but few have the time and opportunity to enroll.

Developing Periphreals for IN OUT Job Control

Have you seen ads offering simple "Z80 Development Boards" for around $150? These boards are "less than the equilivant" of a TS-1000 circuit board, and are used for designers to access the Z80 CPU for dedicated tasks. Many of us have from one to a dozen TS-1000 computers or circuit boards that can be put to use as "Slave Processors". Larry Kenny is doing it to control a milling machine. The principles are discussed broadly in the article "Slave Processing", and is applicable to any HOST Computer.

SPEED COMPARISON BETWEEN 2068 PASCAL and COMPILED BASIC (TIMEMACHINE)

by Larry Kenny

Recently i have been working on using my 2068 to control a 3 axis drilling/ routing machine using stepper motors. To make the machine move in arcs and circles i needed to use the sine and cosine functions in the 2068 rom. After trying some basic and machine language (using the fp interpreter) routines i found that the program couldnt run nearly fast enough to keep the machine busy at full speed.

I asked David Solly who is a long time Hi-Soft Pascal user to write me a test program using its sine/ cosine functions so i could test it against 2068 Basic and compiled basic (Time Machine compiler from Novel Soft).

The test program plots around a circle 100 times. Here are the results.

2068 basic interpreted	.....	150 seconds
Compiled Basic (Time Machine)	.....	126 seconds
HI-SOFT PASCAL	.....	18 seconds

Wow ! The pascal really flies even when doing floating point math. It has all its own math routines built in and doesnt do any rom calls. That also means that the compiled code can be burnt into an eprom and run on a Z80 based cpu without the timex rom resident.

The compiled Basic is only slightly fa ster that regular basic when the floating point routines are used. Even calling the 2068 FP routines from machine code doesnt make much difference.

If you are writing a program that does a lot of calculations such as a spread sheet, 3d graphics, or Cad etc, pascal will far outperform Basic.

Anyone interested in 2068 pascal can leave a message on the Ottawa TS BBS at (613) 745-8838 . If you have a LKDOS disk system i have converted pascals internal file routines for disk instead of tape . There are also numerous pascal source files on the BBS. The BBS runs 24 hours a day on a 2068 using Larken Maxcom.

2068 BASIC Circle Listing

```
5  REM ! OPEN #     (Needed for Time-Machine only)
10 LET RAD = 50
20 FOR A=0 TO 628 STEP .5
30 PLOT 80 + RAD * SIN A , 80 + RAD * COS A
40 NEXT A
50 PRINT "END OF PROGRAM "
```

HISOFT Pascal circle listing

```
5  PROGRAM CIRCLE;

10 PROCEDURE CIRC;
11  CONST RAD =50;
12  VAR
13       A : REAL; ON : BOOLEAN;




14  BEGIN
15       A := 0; ON := TRUE;
16            REPEAT
17                 PLOT  (80 + RAD * SIN(A) ,
18                              (80 + RAD * COS(A));
19                 A := A + 0.5;
20                 UNTIL A > 628;
21  END;

22 BEGIN {MAIN PROGRAM}
23   CIRC;
24   WRITELN ('END OF PROGRAM');
25 END.
```

- SLAVE CPU PROCESSING -

Applicable to ANY Host Computer

by: Bill Jones

Consider a shopping list of 50 items that you make up before going to the shopping mall. Ten items are filled at the first store, and you prepare to depart. The store manager sez, "Friend, give me half of the items left on the list and I'll send out to get them while you're finding the other items". If we do that we are "multitasking" the shopping list.

.....Normally, the TS-2068 operates in "one store at a time". The shelves in the store may contain a disk drive, a monitor, a printer, a modem; and the CPU of the TS-2068 uses one of the items at a time. The other items are just sitting there waiting. Really, it would be convenient and time saving to be able to use the printer while focusing upon another job to be accomplished. Or, we could perhaps be communicating with Compu Serve while printing a document. All we need to do in order to SHARE or use other periphreal devices is to have another CPU in operation, and a "messenger" to send a flag signal to the other CPU to get started doing something. The "Slave" CPU could be one of our TS-1000 computers that are collecting dust, or available at a hock shop for $9.95.

-----The Slave TS-1000 could be programmed to do as much and as many tasks as our trusty TS-2068 normally does. But, it would wait until a messenger told it to do something.

-----The "Messenger" would be a small plug-on circuit board, or an interface. Then anytime we pulled up a menu and punched "S for Slave", the TS-1000 would wake up and return a question, "Whata you want done, Boss?", and would present a menu of things that it is programmed to do. Once we put it to work, we continue doing things with the Master TS-2068.

-----In a multitasking system there is usually an interface that acts as the messenger between the two CPU's. This interface is called a "Temporary Master Access Control Circuit" (TMAC). The TMAC controls INPUT and OUTPUT devices such as printers, modems, etc, and which CPU has control. The TMAC therefore prevents more than one CPU from accessing the same device at the same time.

-----There are several ways of avoiding this type of system clash. Two of the more common methods are to use a INTERRUPT DRIVEN System (IDS), or to use TEMPORARY MASTER ACCESS (TMA).

-----In a IDS system, an INTERRUPT is initiated by the Slave processor to the Master Processor when it requests the use of a system resource. The slave processor is programmed within its own ROM or RAM to do functions operating under self control. When the Slave CPU needs a periphreal, it interrups the Master CPU to tell it to disconnect from that periphreal. Depending upon the PRIORITY, the Master CPU may disconnect or it may send a WAIT signal back. Eventually, when the Slave is given control, it uses the periphreal, BUT is still subject to being INTERRUTED by the main CPU for more important tasks. Eventually, when the Slave CPU is finished with its task, it cancels its request for control of the periphreal. In the meantime, the Master CPU continues other tasks that are not concerned with the use of the periphreal that is being used by the Slave processor.

-----The difference in a TMA system is that the TMAC (interface) is the resources manager instead of the Host CPU "once the host CPU has released control via priority evaluation".

All of the above and more are discussed in detail in a book "Interfacing to S-100/IEEE 696 Microcomputers" by Sol Libes and Mark Garatz. Anyone intending to interface a TS-1000 to the TS-2068 for Slave operation should obtain this book.

The Sinclair Z88

Considerations for Periphreals Design

Since the Z88 uses the Z-80 CPU, some of our better interfaces for the TS-2068 offer the prospects for easy adaptation to the Z88 by BUSS connector changes and re-work of chip addressing. Generally, the engineering has been accomplished for the Z-80 CPU and its 8 bit capability. One seemingly fruitful area is the Disk Drive controllers for the TS-2068.

Exploiting the Z80 CPU Family

With a 2 pound computer having the small foot print of the Sinclair Z88, its interfacing and control of periphreal

devices must be from the outside. This isn't anything new, as even the IBM computer has its BIG BOX sitting behind the keyboard. The Z88 is a "Lap Top" computer designed well for complete portability. Take it on a fishing trip, and if the fish isn't biting, do some computer work! Or, take it on a business trip to enter sales information. But at home, it can be made into a complete system including disk drive, printer, big monitor, modem, and the works.

-----Sooner or later there will be a Z88 "Big System Box" designed to interface it to all periphreals needed to become a Big System. Lets explore the possibilitie.

-----The Zilog Z80 "Periphreal Controllers" offer a broad range of System Integration with the Z80 CPU. This group makes up the "Z80 CPU Family". They are listed briefly;
--The Z80 PIO: Parallel INPUT/OUTPUT Controller.
--The Z80 CTC Counter/Timer.
--The Z80 SIO Serial Input/Output.
--The Z80 SIO/9 Serial Input/Output.
--The Z80 DART Dual Asynchronous Receive Transmitter.
--The Z80 DMA Direct Memory Access Controller
--The Z-UPC/U Universal Periphreal Controller
--The Z-CIO Counter/Timer and Parallel I/O Unit.
--The Z-FIO FIFO Input/Output Interface Unit
The latter offers solutions to interfacing between the Z80 bus and any other asynchornous CPU, or between CPU and periphreal circuits. It can also interconnect components or sub systems that are operating at different clock speeds.

-----The main point in all of this is to call attention to the existing full range of capabilities of the Zilog Z80 family of microprocessors. They are there to be exploited, and the price is right for building the Big System Box that turns the Z88 into a full fledged desk top system to complement its outstanding portable capabilities. And, the users will be eager to upgrade.

- CO-Processing The SINCLAIR QL -

Yes, we already have multitasking capability with the QL. But we do not have the tremendous potential that slave CPU processing offers. The Sinclair QL is already equipped with good Serial IN OUT via the two serial ports, which makes slave CPU processing just a matter of developing the outside processor board. Many have found that "internal multitasking" with the QL is quite slow because the QL is sharing its clock with more than one program in operation. "Co-processing" with a separate CPU is much faster because each CPU is operating at its own clock speed. The only times when either would pause is when time sharing of a single periphreal would be needed, or to cross-talk needed information between the two systems.

- Co-Processing The TS-2068 -

Already we have a number of Parallel and Serial interfaces for the TS-2068 that can serve as IN OUT devices to interconnect a slave CPU. Each Z80 slave can control as much memory, and in the same manner, as does the Host TS-2068. A slave CPU could, for example, control another DOS with four more disk drives. But lets not get carried away! A typical BIG System is Larry Kenny's "Computer Controlled Shop", which I hope that he will eventually share with us some of its concepts.

MORE and still MORE!

Bill Pederson's next article "Sinclair Talks" contributes greatly to the general thesis of "Taking it to the Limit". Here we are, a group of Sinclair Users who could be using stock IBMs to do our computing. Instead we use computers that never did catch the imagination of the World's majority of people. We are unique (if not eccentric). Did you know that 99% of IBM and other Computer users spend all of their time learning to use "Commerical Software"? They do not even THINK in terms of programming, interfacing, upgrading capability, or the concepts discussed in this article- or for that matter, the general subject matter given in most of the Update Magazine articles. If you think that you and we other Sinclar users are "behind the times" with our equipment, then Think Again! Our computer usage is far ABOVE the level of 99% of the Computer users in the World. We may not ever reach the zenith, but we are definitely in the stratosphere in comparison with the general herd.

Some say *"It cannot be done"* while others go about doing it. And, some have more VISION than do others. Bill Pederson has been busy expanding the TS-2068 since it first appeared in the American market. Some of his approaches are unique and deserve study. His article adds insight into the ways of interfacing between computers and the lack of standards used by various computers for their CPU Buss. Despite mis-matching buss connectors all Computers can be interfaced to each other. If there is a will there is a way----------

SINCLAIR TALKS TO PC/XT

Yes! You CAN use PC/XT parallel printer ports for INPUT as well as OUTPUT. The source can be your Sinclair printer driver interface such as TASMAN, A&J, AERCO, OLIGER, or a special unit.

Do you have TS1000, Spectrum or TS2068 files on which you might want to use a word processor? Do you have BASIC programs you want to translate and run on the PC? You might want to transfer purely binary data. This might be graphic images, Z80 code, or instructions to a printer-plotter. A simple adaptor and BASIC program makes all this possible.

Because parallel synchronous transmission uses the strobe signal as a clock instead of CENTRONICS format, AERCO and OLIGER interfaces present a minor complication. Because they automatically generate strobe signals, only half a byte can be transferred at a time.

Figure 1 shows the standard printer (LPTn:) ports to be found in IBM and clone adaptor cards. Under MSDOS these ports are initialized and used only to drive compatible printers. A small BASIC program can be used instead of MSDOS to initialize and use these ports for INPUT.

The synchronous input adaptor is easily made using widely available IDC type connectors and ribbon cable. No soldering is required, but make sure that short stubs of cable are used to engage all unused pins.

It attaches to the end of any CENTRONICS printer cable. It provides nine OUTPUT lines to the PC and one INPUT. The ninth OUTPUT line is the clock. The INPUT line is the BUSY signal. The remaining eight OUTPUT lines is an eight bit data bus.

When control of the strobe signal is automatic, D4 is reassigned to be the clock signal and D5-D8 are used for data nibbles. It takes two transfers per byte of data.

In either mode, bytes are transferred raw. This lets you send any kind of data.

A BASIC program is used in each computer. Machine code routines could easily be written to do the same thing, but the average user need not be concerned. Execution is rather slow, but it works quite well.

SINCLAIR PRINTER INTERFACE ADAPTORS

	TASMAN #1	TASMAN #2	A&J	AERCO/OLIGER
DATA Port	123	123	66	127
STATUS Port	251	191	65	127
BUSY Bit Value	1	1	4	16
STROBE Port	251	251	65	Auto
STROBE Bit Value	8	8	4	none
STB_ON	247	247	4	Write Data
STB_OFF	255	255	0	Read Status

There is some confusion about identification of TASMAN interface types. According to TASMAN documentation, #1 is type A, #2 is type B. USA has an ambiguous documentation in the literature. Not all existing commercial interfaces are listed; but if you have the porting data, merely substitute that in one of the routines listed. Note that A&J STROBE port inverts the signal. This might also be true for interfaces not listed.

TS2068/SPECTRUM Transfer Routines

```
1000 REM   TASMAN #1 CALL with B = Data Byte
1010 LET BB=INP 251: LET X=INT(BB/2): LET X=BB-X-X
1020 IF X THEN GOTO 1020: REM BUSY
1030 OUT 123,B:OUT 251,247: REM Data out,Strobe ON
1040 LET BB=INP 251: LET X=INT(BB/2): LET X=BB-X-X
1050 IF NOT X THEN GOTO 1050: REM Wait for ACK
1060 OUT 251,255: RETURN: REM Strobe OFF

1000 REM   TASMAN #2 CALL with B = Data Byte
1010 LET BB=INP 191: LET X=INT(BB/2): LET X=BB-X-X
1020 IF X THEN GOTO 1010: REM BUSY
1030 OUT 123,B: OUT 251,247:REM Data out,Strobe ON
1040 LET BB=INP 191: LET X=INT(BB/2): LET X=BB-X-X
1050 IF NOT X THEN GOTO 1040: REM Wait for ACK
1060 OUT 251,255: RETURN: REM Strobe OFF

1000 REM   A&J CALL with B = Byte to Transfer
1010 LET BB= INP 65: LET X=INT(BB/64): LET X=BB-
64*X
1020 IF X>3 THEN GOTO 1010: REM BUSY
1030 OUT 66,B: OUT 65,4: REM Data out, Strobe ON
1040 LET BB= INP 65: LET X=INT(BB/64): LET X=BB-
64*X
1050 IF X<4 THEN GOTO 1040: REM Wait for ACK
1060 OUT 65,0: RETURN: REM Strobe OFF

1000 REM   AERCO/OLIGER CALL with B = Data Byte
1010 LET H=INT(B/16): LET L=B-16*H: REM Make
Nibbles
1020 LET BB= INP 127: LET X=INT(BB/16): LET X=BB-
16*X
1030 IF X>15 THEN GOTO 1020: REM BUSY
1040 OUT 127,16*H+8: REM Msn out, CLOCK HI
1050 LET BB= INP 127: LET X=INT(BB/16): LET X=BB-
16*X
1060 IF X<16 THEN GOTO 1050: REM Wait for ACK
1070 OUT 127,16*H: REM Msn kept, CLOCK LO
1080 LET BB= INP 127: LET X=INT(BB/16): LET X=BB-
16*X
1090 IF X>15 THEN GOTO 1080: REM BUSY
1100 OUT 127,16*L+8: REM Lsn out, CLOCK HI
1110 LET BB= INP 127: LET X=INT(BB/16): LET X=BB-
16*X
1120 IF X<16 THEN GOTO 1110: REM Wait for ACK
1130 OUT 127,16*L: RETURN: REM Lsn kept, CLOCK LO
```

PC/XT Transfer Routines

```
100 CLS:PRINT:PRINT:PRINT"      DATA TRANSFER FROM
SINCLAIR TO PC/XT"
110 PRINT:INPUT "HOW MANY BYTES? ";COUNT
120 PRINT:INPUT "FILENAME? ";FILE$
130 PRINT:PRINT"BASE = 956 FOR DISPLAY ADAPTER
PRINTER PORT
140 PRINT"BASE = 888 FOR PRIMARY PARALLEL PRINTER
PORT
150 PRINT"BASE = 632 FOR MODIFIED PARALLEL PRINTER
PORT
160 INPUT" ENTER BASE ADDRESS: ";PDATA
170 IF PDATA=0 THEN LET PDATA=888:PRINT"DEFAULT
BASE = 888"
180 LET PSTATUS=PDATA+1:LET PCONTROL=PDATA+2
```

```
190 OUT PDATA,1:OUT PCONTROL,4:REM  BUSY,
Initialize CONTROL Port for INPUT
200 DEF SEG 16386:REM Assign buffer in memory
(640K assumed)
210 PRINT" Connect Printer Cable w/ Adaptor, then
CONTINUE (F5).":STOP
220 FOR N=0 TO COUNT-1
230 OUT PDATA,0:REM  READY

235 REM For TASMAN/A&J, full byte transfer
240 L=INP(PCONTROL):STB=L AND 1:IF STB=1 THEN GOTO
190
250 OUT PDATA 1:REM  BUSY
260 L=(L/2) AND 7 XOR 5:H=INP(PSTATUS) AND 247 XOR
128
270 BYTE=H OR L:POKE N,BYTE:REM  Assemble & Store
BYTE
280 LOCATE 21,0:PRINT N,BYTE,:REM  Verification
290 STB=INP(PCONTROL) AND 1:IF STB=0 THEN GOTO
230:REM  Wait for ACK
300 NEXT N:BSAVE FILE$,0,COUNT-1:STOP

235 REM For AERCO/OLIGER, nibble transfer
240 H=INP(PSTATUS):STB=H AND 8:IF STB=8 THEN GOTO
240
250 OUT PDATA 1:REM  BUSY
260 H=H AND 240 XOR 128
270 STB=INP(PSTATUS) AND 8:IF STB=0 THEN GOTO
270:REM  Wait for ACK
280 OUT PDATA,0:REM  READY
290 L=INP(PSTATUS):STB=L AND 8:IF STB=8 THEN GOTO
290
300 OUT PDATA 1:REM  BUSY
310 L=(L AND 240 XOR 128)/16
320 STB=INP(PSTATUS) AND 8:IF STB=0 THEN GOTO
320:REM  Wait for ACK
330 BYTE=H+L:POKE N,BYTE
340 LOCATE 21,0:PRINT N,BYTE,:REM  Verification
350 NEXT N:BSAVE FILE$,0,COUNT-1:STOP
```

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IEEE-488 for SINCLAIR USERS

In the pages of LIST there have appeared designs for decent interfaces using Z80 PIO chips and dip switch settable addressing. There have also been some very convenient specialized versions which do only one thing well.

The lack of a decent source for general purpose interfaces has kept most people from taking full advantage of the features of full size printers, plotters, and other non-TIMEX/sinclair products.

John McMichael has come out with a driver for the COMMODORE printer/ plotter and color printer. My personal congratulations to him.

It is not widely known that the COMMODORE serial port is a simple form of the IEEE-488 GPIB with serial data transfer in place of parallel. It holds no mysterious secrets. What is needed to do the same with a TS2068, SPECTRUM, or QL is a half way decent interface.

Half way decent means that the interface must be program configurable so all the pins on the device to be run (printer or otherwise) are made available as input or output - not just one unique device, but for whatever you want to attach. A single PIO will usually fill the bill.

HORRORS! How can a PIO be used for serial communications? Doesn't it take a UART or an SIO?

It depends on how fast you want to transfer data. A UART or SIO is very handy if you want your CPU to handle bytes of data. The overhead for testing UART status makes that slower than you might expect.

If you settle for bits instead of bytes, all the popular data transmission protocols become available to you. When you consider that includes Local Area Networking and Mainframe access, you might ask why nobody ever marketed a half way decent I/O interface.

My guess is that people were so disgruntled with the limitations of the TS2068 that they didn't feel like trying. A few diehards have stayed with it, however. Even so, their efforts have not been exactly welcomed with opened arms so they could make a fair return for their honest sweat.

The answer to this dilemma is to make a series of small, but effective improvements which will not have to be redone later, and not so specialized they don't allow other uses. A half way decent interface is one of these.

Those who have read some of my previous articles should know that I think the TS2068 is inherently one of the most powerful and fast computers around, even at triple the price. It suffers because of barriers in ROM and bad documentation which have people snowed into believing it was a comedy of errors and mismanagement.

Don't you believe it!

Replace that accursed ROM and you have a jewel of a machine. SCLD video modes are highly advanced; even better than CGA cards. How come nobody has written any software which takes advantage of it? All I have seen is a couple of pieces of artwork.

A serious suggestion is to get rid of that special connector arrangement in favor of one that is commonly available. Why make everything depend on stacking up device after device that won't fit anything else? I have suggested that the IBM connector is perfectly suitable, economical, and has the possibility of accepting clone cards. That would make it easier for our favorite computer to stretch its wings. One of those cheap clone cards happens to BE a half way decent parallel port. Why pay more?

The COMMODORE information shows how six I/O pins from a PIO (or even the joystick port!) can be used to run their disk drives, printer/plotter and graphic printer with your "obsolete" computer. My reason for supplying this information is to get you users out there to get off your duffs and begin to demand (and get) better things made for you. Support your suppliers by being willing to pay what the products are worth - and they WILL be worth it. SOUND OFF! The TS2068 is still in production legally and otherwise around the world. That should tell you something. Everywhere but here? Why?

Show a little support and wonders can happen. Your computer is not just an obsolete toy. Slay those software TROLLS with your support.

Did you catch that reference to the joystick

port? Whether you missed it or not, look for "*DR. STRANGEQUARK'S SUPER-DUPER JOY GENERATOR*", coming soon to your local newsletter.

DR. STRANGEQUARK'S SUPER-DUPER JOY GENERATOR

Have you been barking up trees like a hound dawg with its tail between his legs futilely hunting for some **WAY** for your **TS2068** to *SPEAK* to a ##NEIGHBOR##?.
Is that what's *BUGGING* you Bunky?

Well, ##FRIEND##, a !!MARVELOUS CURE!! for your **DISSATISFACTION** is $$FORTHCOMING$$. Tune in your **AUDITORY SENSOR DEVICES** & !!LISTEN!!

GET THAT IDIOT OUT OF HERE!!

That's better. Sigh.....

So -- what IS this all about?

When TIMEX released the TS2068, they did a logical thing -- for them, but not for us.
In order to prevent using the joystick port (IOA) for OUTPUT to devices that TIMEX didn't make and others DID, they left off the GND connection.
This barrier is easily bypassed, but first you need to know it was put there on purpose. If you don't, it is just another example of something that doesn't work. You've been faked out.

When used for joysticks, the port is in the INPUT mode. Signals are pulled down to near GND level by a transistor through pin 6 left, or 6 right. There is no need for a GND pin, which was supposed to be pin 9 both right and left. Diodes prevent one joystick from interfering with the other.

ANY device which can pull signal lines low can be used for INPUT. It need not be a joystick.

When it comes to OUTPUT, the situation is a bit different. Joystick pins can be driven high, but because of the diodes, cannot be driven low. Low IOA port signals cannot get through.
Unless the joystick pins are pulled low by resistors to GND, they cannot be used for OUTPUT. Now where is that GND pin? It figures.....

Can it really be that simple?
Yes. It CAN be and IS.

First, cut a joystick extension cord in half. If you like to be neat, uses a small hunk of perf board to tie down the cut ends and make room for five 15k 1/4W resistors. Jumper all the wires as if they had not been cut. Then wire one end of each resistor to wires from pins 1, 2, 3, 4, & 6. Wire all the other ends to the wire from pin 9 and another 16" long wire for picking up GND from any other convenient location. Wrap this mess in insulating tape and you nearly have it.

The cable end is the wrong sex to fit the joystick port of another TS2068. You can either use a sex change adapter, or make your cable from two extension cords. The latter is probable the cheaper and better approach.

My preference for picking up the GND is to strip some insulation from the BAR cable and use a small alligator clip on the 16" wire. You can use any method you wish.

HARK to this *ASTOUNDINGLY* !!GOOD NEWS!!

Oh, SHADDUP!

The good news is that you now have a fully functional port which can be used for any job which does not require more than five signal pins.
This includes driving the COMMODORE daisy chained serial synchronous interface, for one.
The TS2068 SOUND instruction can be used to drive this interface, or machine code routines can be used. The variety of applications possible is so great that I will leave it up to you eager programmers to have a go at it. One that comes immediately to mind is nibble transfer from one TS2068 to another with handshaking.

Dr. Strangequark

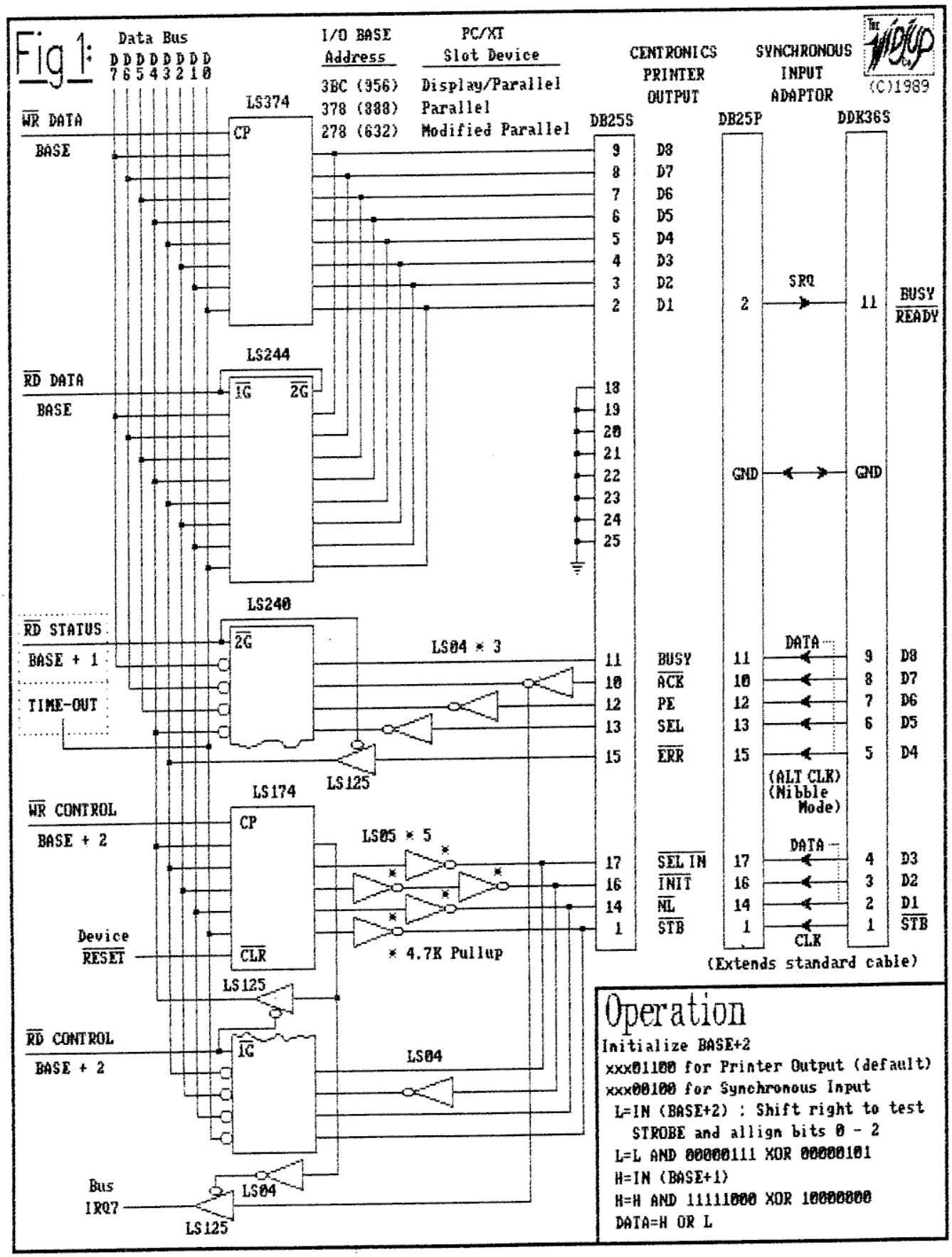
Summary: A *Generic Computer* has not yet been offered to the public and may not ever be. A generic computer would provide the standardization needed for direct hook up between computers of the same type or between different kinds to provide additive capability. Two or more computers can be operated as an integrated system by proper interfacing.

The concept runs counter to the special interests of each manufacturer of computers who would like for their product to be exclusive. Because of non-standard buss construction Interfaces must be specially designed.

The big money is in selling whole computers and their needed periphreals. Software Sales for specific types of computers comes next in market potential. Manufacturers are not even slightly interested in developing their products to be capable of co-processing with another brand of computer. The market potential for devices and software to support "two brands of computers" working in an integrated environment is not strong. Thus there are few who will spend the time to work toward interfacing computers.

Many Sinclair users have two or more computers, some as many as a half dozen. We Sinclair users have much to gain by interfacing to gain co-processing capability. Doing that with the QL is the easiest. Interfacing between two different computers is more difficult, but is practical and inexpensive to accomplish.

The following names are mentioned as leaders in the Sinclair User Group who are active in interfacing projects: Larry Kenny (Larken Electroncis), Bill Pederson (WIDJUP), John McMichael, John Oliger, Larmour Crawford, Charles Bothner. I suspect that these entrepreneurs could develop a super capable *generic PC computer* if we could lock them up together in a garage shop. _BJ-

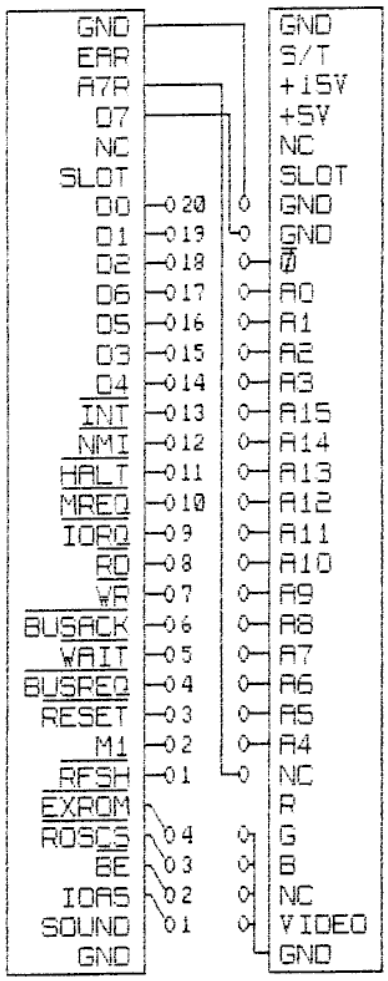


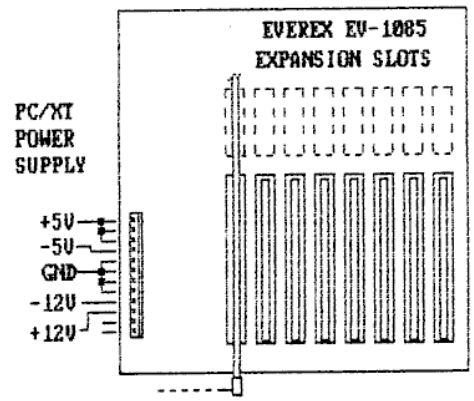
Operation

Initialize BASE+2
xxx01100 for Printer Output (default)
xxx00100 for Synchronous Input
L=IN (BASE+2) : Shift right to test
STROBE and allign bits 0 - 2
L=L AND 00000111 XOR 00000101
H=IN (BASE+1)
H=H AND 11111000 XOR 10000000
DATA=H OR L

TS2068 BACK-PLANE EXPANSION SYSTEM STANDARD

IDC TAKE-OFFS





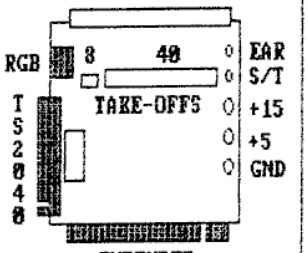
TS2068 BUS TO EVEREX EV-1085

2068	IBM	I/O EDGE		IBM	2068
[GND]	[GND]	B1	A1	CH CK	$\overline{\text{NMI}}$
$\overline{\text{RESET}}$	RST DV	B2	A2	D7	D7
[NC]	[+5V]	B3	A3	D6	D6
##	IRQ2	B4	A4	D5	D5
[NC]	[-5V]	B5	A5	D4	D4
$\overline{\text{BUSREQ}}$	DRQ2	B6	A6	D3	D3
[NC]	[-12V]	B7	A7	D2	D2
$\overline{\text{M1}}$	$\overline{\text{CD SEL}}$	B8	A8	D1	D1
[NC]	[+12V]	B9	A9	D0	D0
[GND]	[GND]	B10	A10	CH RDY	$\overline{\text{WAIT}}$
$\overline{\text{MREQ}}$	$\overline{\text{MEMW}}$	B11	A11	AEN	$\overline{\text{BUSACK}}$
$\overline{\text{IORQ}}$	$\overline{\text{MEMR}}$	B12	A12	A19	*A19*
$\overline{\text{WR}}$	$\overline{\text{IOW}}$	B13	A13	A18	*A18*
$\overline{\text{RD}}$	$\overline{\text{IOR}}$	B14	A14	A17	*A17*
$\overline{\text{ROSCS}}$	$\overline{\text{DACK3}}$	B15	A15	A16	*A16*
$\overline{\text{HALT}}$	DRQ3	B16	A16	A15	A15
A7R	$\overline{\text{DACK1}}$	B17	A17	A14	A14
$\overline{\text{BE}}$	DRQ1	B18	A18	A13	A13
$\overline{\text{RFSH}}$	$\overline{\text{DACK0}}$	B19	A19	A12	A12
$\overline{\text{Ø}}$	CLOCK	B20	A20	A11	A11
##	IRQ6	B21	A21	A10	A10
$\overline{\text{INT}}$	IRQ7	B22	A22	A9	A9
##	IRQ5	B23	A23	A8	A8
##	IRQ4	B24	A24	A7	A7
##	IRQ3	B25	A25	A6	A6
$\overline{\text{EXROM}}$	$\overline{\text{DACK2}}$	B26	A26	A5	A5
$\overline{\text{IOAS}}$	I/C	B27	A27	A4	A4
NC	ALE	B28	A28	A3	A3
[NC]	[+5V]	B29	A29	A2	A2
NC	OSC	B30	A30	A1	A1
[GND]	[GND]	B31	A31	A0	A0

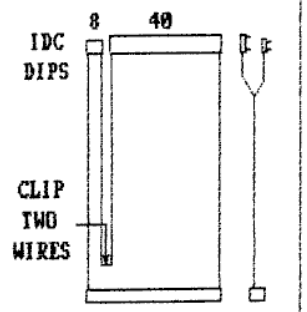
[] = EVEREX WIRED CONNECTION.

PRIMARY ADAPTER

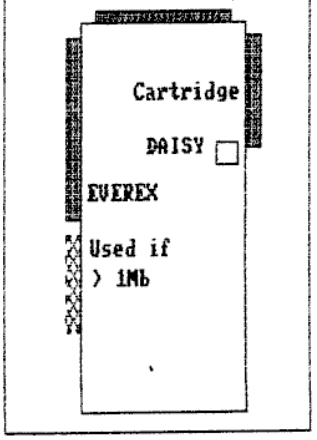
TS2068 REAR CONNECTOR



CABLE ASSEMBLY

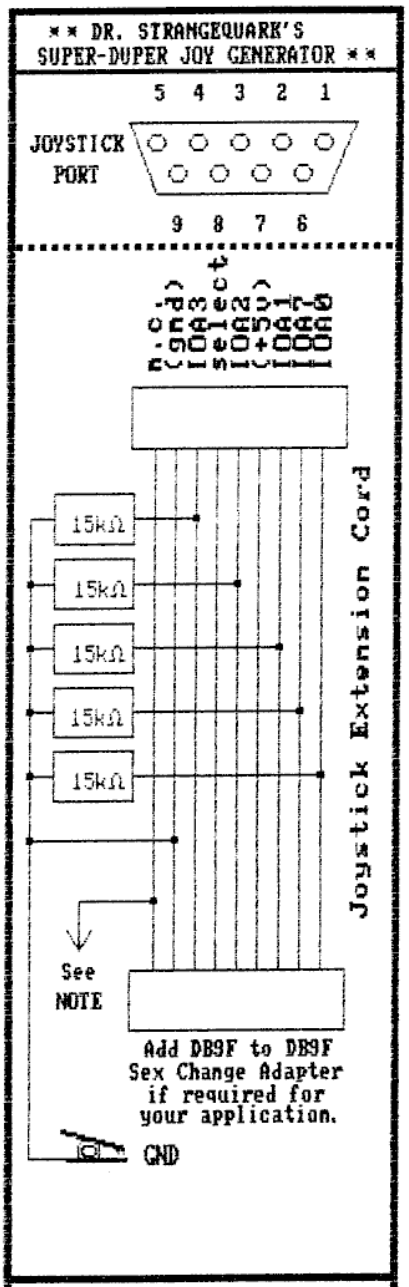


BUS DRIVER CARD

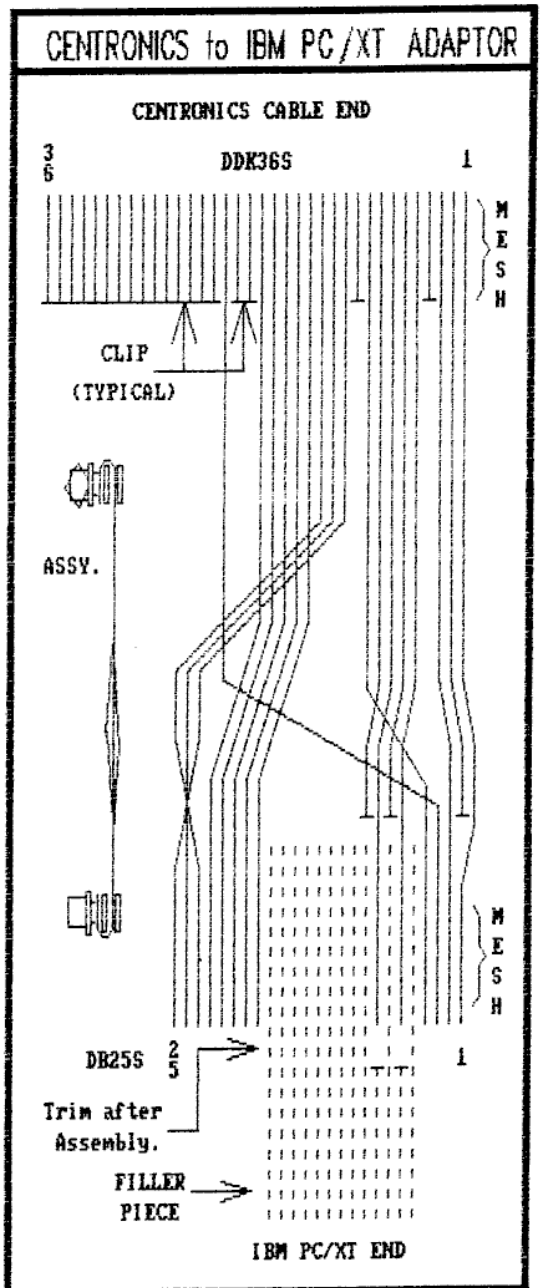


NOTES:

1. Card has same general layout for all applications.
2. Table shows connections used when IBM compatibility is not implemented.
3. New Cartridge slot must be used if bank switching is implemented. ($\overline{\text{BE}}$ conflict)
4. DAISY is for advanced WIDJUP autoconfiguring use.
5. User cards can have two edges, one for each system.



NOTE: IOA5 is available at the IS2068 rear connector, and on the WIDJUP standard adaptor. If this signal is brought in and connected to Pin 5, there are enough signal lines for full bidirectional handshake when transferring nibbles.



Carefully prepare 36 conductor ribbon cable as shown above. The MESH includes allowance for strain relief. the FILLER PIECE is needed to assure proper spacing.

When assembling, make sure to correctly match up Pin 1. A small vise can be used to make assembly easier.

IEEE-488 COMMODORE Synchronous Serial Interface (GPIB)

The serial bus is a daisy-chain arrangement designed to let the computer communicate with synchronous serial devices like disk drives, printers, and plotters. Up to 5 devices can be connected to the bus. There are three types of operation: CONTROL, TALK and LISTEN. The computer is the CONTROLler. It can also TALK and LISTEN. A TALKer puts data onto the bus. Only one device can TALK at any time or chaos results. Any number can LISTEN.

All devices on the bus receive all signals. To select which device is to respond to the data, a "primary address" is put on the bus. This can be from 4 to 31 for the COMMODORE 64.

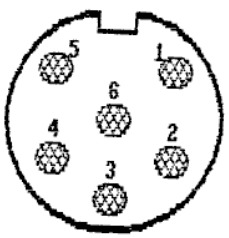
The computer can COMMAND any addressed device to TALK, LISTEN or both. A "secondary address" allows selection of features within the addressed device, like font selection and graphic modes.

OPEN 1,4,7 will assign the printer (4) to stream #(1) and set up the UPPER / LOWER case mode (7). This puts nothing on the bus, but sets up a device control block belonging to stream #1.

NUMBER	DEVICE
4 or 5	VIC-1525 GRAPHIC PRINTER
6	VIC-1520 PRINTER PLOTTER
8 to 11	VIC-1541 DISK DRIVES

SERIAL BUS PINOUTS (5K PULL-UP Open Collector)

Pin	Description		Active	
1	SERIAL SRQ IN		L	Device needs service.
2	GND			
3	SERIAL ATN	IN/OUT	LO	COMMAND identifier
4	SERIAL CLK	IN/OUT	LO	Computer / GPIB etc.
5	SERIAL DATA	IN/OUT	LO	DATA strobe, Handshake
6	RESET	OUT	LO	DATA bits, LSB first



THE WIDGET Co.

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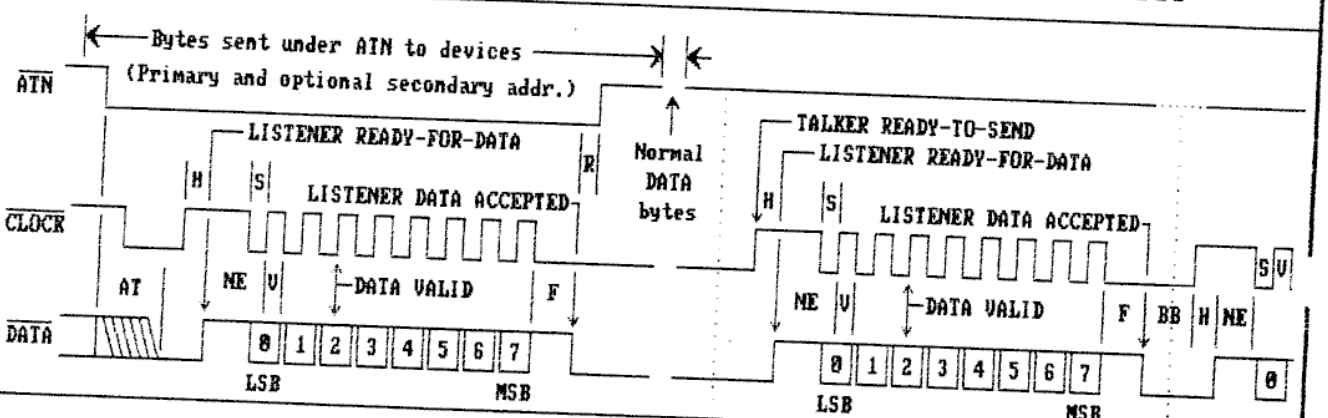
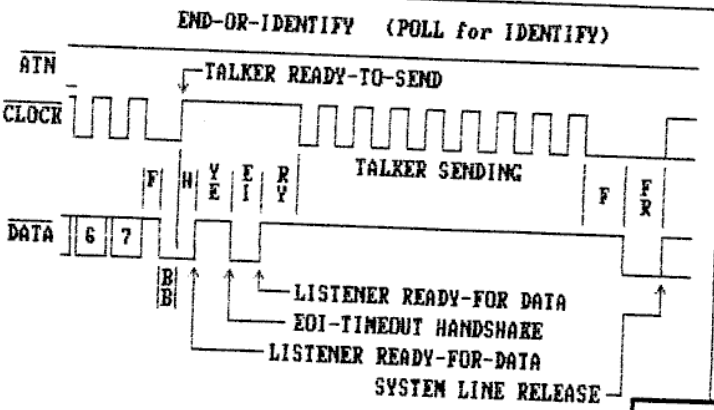
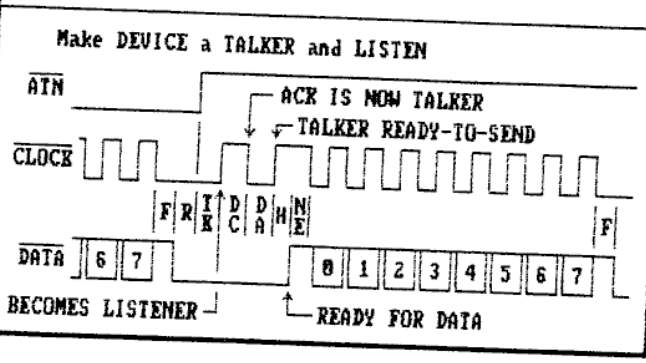




NOTES:

1. "Device not present" if > max.
2. EOI response required if > max.
3. Frame error if > max.
4. V and PR 60 uSEC min for TALKER.
5. Timing of TK, DC and DA depends on how long it takes for the XLISTENER to recognize the "wrong" polarity of DATA, the XTALKER to recognize the "wrong" polarity of CLOCK, and adjust states accordingly.



SERIAL BUS TIMING (uSEC)

Symbol	Description	Note	Min	Typ	Max
AT	ATN Response (Required)	1	---	---	1000
H	LISTENER Hold-Off		0	---	INF
NE	Non-EOI Response to RFD	2	---	40	200
S	BIT Set-Up, TALKER	4	20	70	---
V	DATA Valid		20	20	---
F	FRAME Handshake	3	0	20	1000
R	FRAME to Release of ATN		20	---	---
BB	Between BYTEs		---	---	---
YE	EOI Response		200	250	---
EI	EOI Response Hold		60	---	---
RY	TALKER Response Limit		0	30	60
PR	BYTE Acknowledge	4	20	30	---
DC	DATA Held LO by XTALKER	5			
DA	CLOCK Held LO by XLIS'R	5			

PLOTTING EQUATIONS with RADICALS

by: Warren Fricke

Before we get deeply involved in this tutorial, let's have a brief review of radicals. We will restrict our discussion to that which we need to know to plot equations containing them. A radical is the root of a number, or a number expression, called a radicand. We are involved herein only with those of the second order, which are usually known as square roots. There are only two things for us to remember. ONE..... The square root of a negative number is imaginary. For us, and the computer, it doesn't exist. TWO.... All square roots have two solutions, a plus one and a minus one. To illustrate, there is no real root for the square root of -4, but the square root of +4 can be either +2 or -2.

Another thing to remember is that powers, like the square or cube of a number on the TS2068, as on many other computers, are evaluated by the use of an algorithm employing logarithms. As there are no logarithms of negative numbers, we must resort to an alternate method of expression. For example, the computer will not work with (-2)↑3, the cube or third power of -2 (answer=-8), but it will accept (-2)*(-2)*(-2), which is the same thing.

So when we have an equation containing a radical or a power to plot, we must take steps to consider the computer's shortcomings. If we don't, we'll be plagued by "invalid argument", error reports, and a hung-up program.

In each of the following programs line 140 is devised to look at the radicand to see if its value is positive or negative. If it has a value less than 0, it must be negative and its root is imaginary. Thus a line such as 150 skips over it. If the radicand is positive and acceptable, lines such as 160 and 170 initialize the value of the equation for each + or - value of its radical.

We are not yet "out of the woods". As in the previous tutorial on the graphing of polynomials, we must test the magnitude of y1, y2, etc., at each point along the X-axis, before attempting to plot a pixel. If the absolute value of the ordinate is too great, the computer will try to plot beyond the confines of the screen. So these values must be skipped to avoid getting an "out of range" error report, and another hung up program. Lines such as 180 and 200 do this for us.

After each equation or its +/- counterpart is so tested and found to be acceptable, its pixels are plotted by lines such as 190, 200, etc. Notice that there is only one FOUR - NEXT loop. All computed values are plotted in a single pass thru this loop. We could have plotted the equations sequentially, repeating the loop, but a single loop is a tad quicker.

There is one other problem we call again to your attention. It was mentioned in an earlier tutorial called, "Circles on the TS2068". The vertical scale and the horizontal scale of the Timex screen is not 1:1. The vertical scale is stretched so that a circle looks like an ellipse with major axis vertical. This can be very nearly offset by using 4 vertical pixels to 5 horizontal pixels in a required 1 to 1 relationship. Hence, in the selection of the scale factors V and H, we used 80 vertical pixels to represent 10 units and 100 horizontal pixels to represent 10 units. Eighty to one-hundred is a 4 to 5 ratio. Shapes will now suffer very little distortion.

Program G-13 plots two equations simultaneously.....

```
y↑2+4y+x↑2-4x-56=0
(2-y)x↑2-16=0
```

These two were rewritten to express y as a function of x, resulting in.....

```
y=-2+or -(-x↑2+4x+60)↑.5
y=2-16/x↑2
```

Students of math among us may recognize these equations right off as a circle and hyperbola. Also, they may rightfully contend that both curves can easily be roughed in by determining the center and radius of the circle, and the assymptotes and void areas of the hyperbola. But not all curves are as easily analyzed and plotted. The TS computer, however, can handle equations that are not readily analyzed, just as easily as the two in these examples.

Program G-14 considers the equations of a parabola and an other hyperbola. They are.....

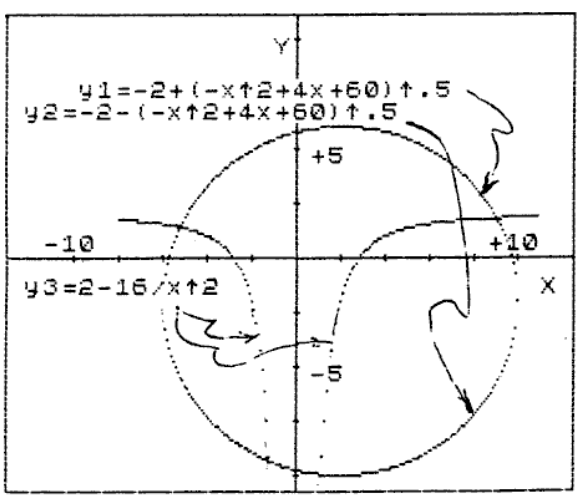
```
y↑2=4(8-x)
(y-1)↑2(x-1)=1
```

When we rewrite these to express y in terms of x, we get..

```
y=+ or -2(8-x)↑.5
y=1+ or -(x-1)↑(-.5)
```

Note that to plot a complete curve where y is expressed in terms of x and a radical, there will be upper (+) and lower (-) parts of the curve. These separate parts are identified by y1, y2, y3, and y4.

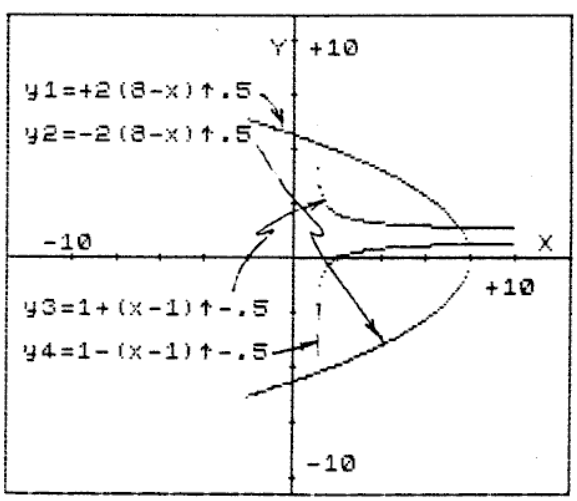
```
  5 REM ** "G-13", 7-22-89, WF
 10 REM ** PLOTTING EQUATIONS
           with a RADICAL
 20 PLOT 0,86: DRAW 0,-86: DRAW
 255,0: DRAW 0,86: DRAW -255,0:
DRAW 0,89: DRAW 255,0: DRAW 0,-8
9: PLOT 130,0: DRAW 0,175
 40 FOR n=6 TO 166 STEP 20: PLO
T 129,n: PLOT 131,n: NEXT n
 50 FOR n=30 TO 230 STEP 20: PL
OT n,87: PLOT n,85: NEXT n
 60 PRINT AT 1,15;"Y";AT 12,30;
"X"
 70 PRINT AT 5,17;"+5";AT 16,17
;"-5": REM ** SCALE, Y-AXIS
 80 PRINT AT 10,2;"-10";AT 10,2
7;"+10": REM ** SCALE, X-AXIS
100 LET V=8: LET H=10
120 FOR x=-8 TO +11 STEP .1
130 REM ** FIRST CURVE
140 LET radical=-x*x+4*x+60
150 IF radical<0 THEN GO TO 220
160 LET y1=-2+radical↑.5
170 LET y2=-2-radical↑.5
180 IF ABS y1*V>86 THEN GO TO 2
00
190 PLOT x*H+130,y1*V+86
200 IF ABS y2*V>86 THEN GO TO 2
20
210 PLOT x*H+130,y2*V+86
220 REM ** SECOND CURVE
230 LET y3=2-16/(x*x)
240 IF ABS y3*V>86 THEN GO TO 2
60
250 PLOT x*H+130,y3*V+86
260 NEXT x
300 PRINT AT 3,4;"y1=-2+(-x↑2+4
x+60)↑.5"
310 PRINT AT 4,1;"y2=-2-(-x↑2+4
x+60)↑.5"
320 PRINT AT 12,1;"y3=2-16/x↑2"
```



There are simplier ways of plotting these curves, but the method used here allows us to suggest a means of solving these equations simultaneously, using the computer to do the heavy, tiring computations. It involves computing the common x and y values at their points of intersection. This will be the subject of some future tutorial. Hang in there.....

Warren Fricke

```
  5 REM ** "G-14", 7-22-89, ..
 10 REM ** PLOTTING EQUATIONS
           with TWO RADICALS
 20 PLOT 0,86: DRAW 0,-86: DRAW
 255,0: DRAW 0,86: DRAW -255,0:
DRAW 0,89: DRAW 255,0: DRAW 0,-8
9: PLOT 130,0: DRAW 0,175
 40 FOR n=6 TO 166 STEP 20: PLO
T 129,n: PLOT 131,n: NEXT n
 50 FOR n=30 TO 230 STEP 20: PL
OT n,87: PLOT n,85: NEXT n
 60 PRINT AT 1,15;"Y";AT 10,30;
"X"
 70 PRINT AT 1,17;"+10";AT 20,1
7;"-10": REM ** SCALE, Y-AXIS
 80 PRINT AT 10,2;"-10";AT 12,2
7;"+10": REM ** SCALE, X-AXIS
100 LET V=8: LET H=10
120 FOR x=-2 TO +10 STEP .1
130 REM ** FIRST CURVE
140 LET radical=8-x
150 IF radical<0 THEN GO TO 220
160 LET y1=+2*radical↑.5
170 LET y2=-2*radical↑.5
180 IF ABS y1*V>86 THEN GO TO 2
00
190 PLOT x*H+130,y1*V+86
200 IF ABS y2*V>86 THEN GO TO 2
20
210 PLOT x*H+130,y2*V+86
220 REM ** SECOND CURVE
230 LET radical=x-1
240 IF radical<0 THEN GO TO 295
250 LET y3=1+radical↑-.5
260 LET y4=1-radical↑-.5
270 IF ABS y3*V>86 THEN GO TO 2
85
280 PLOT x*H+130,y3*V+86
285 IF ABS y4*V>86 THEN GO TO 2
95
290 PLOT x*H+130,y4*V+86
295 NEXT x
300 PRINT AT 3,1;"y1=+2(8-x)↑.5
"
310 PRINT AT 5,1;"y2=-2(8-x)↑.5
"
320 PRINT AT 13,1;"y3=1+(x-1)↑-
.5"
330 PRINT AT 15,1;"y4=1-(x-1)↑-
.5"
```



Flashback

David Youngquist

Before I begin talking about Flashback I need to say a little bit about Archive. After all, why buy another database program when you get one free with your computer?

I've always liked databases, and I like Archive, but.... Bill Cable's columns have shown me that I certainly haven't learned everything about Archive. I've never even had a data file lock me out from forgetting to close it. Though I have fallen asleep waiting for a search thru a 150K data file on disk. That perhaps is Archive's biggest weakness; it keeps the bulk of its data on your microdrive cartridge or disk. Searches are terribly slow while it looks at each bit of data on the drive to see if it is the one needed. The nice thing about this is it allows standard 128K machines to keep data files much larger than they could handle in RAM. When one expands their QL with extra RAM this plus turns into a liability. [Editor's note : if you have enough free RAM, once an ARCHIVE database or any file has been totally read once the QL keeps a copy in RAM and eliminates unnecessary device accesses. With archive a simple way to get a database into RAM is to Search for something that won't be found. If you are altering or inserting there will be lots of device accesses in any case. Also if you order your ARCHIVE database and use the Locate command you can have near instantaneous searches no matter how big the database is.]

Flashback keeps its data file in RAM. In fact it will multi-task, by itself, with another program without needing Taskmaster or QRAM. I have a setup with just Quill and Flashback that I find very useful. From another program pressing the 'ALT' and '\' together (or another defined pair) will bring up Flashback. It also works fine with Taskmaster.

Flashback has records and fields in the records like Archive. However a record or a field can be one character long or 10s of thousands of characters long. A record can have only one field or up to 60 fields. The number of fields or the field length can be different for each record. A field marker can be deleted joining two fields or sub-field markers added. A single record can also be split into two records at any point.

Flashback has the standard database commands (NEXT, BACK, FIRST, LAST, etc.) and some interesting new ones. Using the MERGE command picks up ASCII text from most any source. Capturing a Quill file or SuperBASIC listing is easy. There is a utility to convert Archive files to Flashback. One can pop out of Flashback with a record and place it into Quill, SuperBASIC or whatever. Use Flashback to capture a series of standard SuperBASIC procedures and file them. When you are writing a program in SuperBASIC call up Flashback and do a search to find the one wanted and bring it back to SuperBASIC.

Searches are advertised to be 100 times faster than Archive. My experience is that they have been as near to instant as I can tell. If anything is done to change the file then it needs to be SAVEd. This is much more safe than having the file OPEN during the changes.

The worst thing about databases is having to type in all that data! Here is a way to have your QL make a very useful database for you. Take a look at the SuperBASIC listing I call 'Directory'. This sends the information from Toolkit II's WSTAT (like DIR but more data) of a number of disks or microdrive cartridges to a RAM disk file. I then capture it with Flashback's MERGE command and have a smart library guide to all my software medium.

Those without Toolkit II will need to delete line 100 and change the WSTAT in lines 160 and 230 to DIR. Those without RAM disks can change their reference in lines 160, 220 and 240 to a device they are not using. This means if you are using microdrive 1 to scan directories then keep your catalog of directory information on microdrive 2.

Run Flashback with an empty database and Directory in SuperBASIC. The program asks how may files, and this means how many cartridges or disks you wish to scan. When all the disks or microdrive cartridges are scanned for their directories then go into Flashback and CREATE a new record. Then use the MERGE command to 'MERGE_ram3_file#1' and the directory inforation is now in your record. You may add field markers at your leisure. The file name "file#1" is also arbitrary and easily changed. Next CREATE a new record again and MERGE. Use the cursor control to go to the end of the prompt and change it to 'MERGE_ram3_file#2'. And so on until all the directories are now records.

I purchased Flashback from Sharps for $40 and feel it is a good value.

Directory : A *SUPERBASIC Program to use with Flashback*

```
10 REMark Directory Record Maker for
Flashback
20 By-  David Youngquist
30 REMark unwitting help by Mike Lloyd in
5/89 QL World
100  TK2_EXT
110  CLS:CLS#2:CLS#0
120  INPUT"Don't forget the '_'!"\\"Device?
";d$
130  INPUT\'How many files? ';n
140  FOR z=1 TO n
145    n$='file#'&z
147    AT#0,0,48:PRINT#0\'Insert
disk/cartrige':wait
150    scan
160    CLS#0:CLS#2:PRINT#2,'Directory list in
RAM3'\:WSTAT#2,ram3_
170  END FOR z
175 AT#0,1,48:PRINT#0,"All done"
180 :
190 DEFine PROCedure scan
210   CLS
220   OPEN_NEW#3,'ram3_'&n$
230   WSTAT#3, d$: CLOSE#3
240   OPEN_IN#3,'ram3_'&n$
250   INPUT#3, line$:PRINT "CATALOG: "\;line$
260   REPeat loop
270     FOR x = 1 TO 18
280       INPUT#3,line$:PRINT line$
290       IF EOF(#3): EXIT loop
300       IF KEYROW(1) = 8: EXIT loop
310     END FOR x
320     PRINT "More >":PAUSE
330     AT 2,0:CLS 3:CLS 2
340   END REPeat loop
350   CLOSE#3
360   wait
370 END DEFine scan
380 :
390 DEFine PROCedure wait
400   AT#0,2,48:PRINT#0," Touch any key
":PAUSE:CLS#0
410 END DEFine wait
420 :
```

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If you have ever wasted time trying to find a file in your pile of disks and microdrives you need the help of CHAOS BUSTERS . Consisting of :

DIRLUX - Displays and prints your media directory in column format, natural or alphabetic order, screen paging for long directories. It has a search function for locating and displaying file names containing a specified string. Saves your eyes in spotting a file. You can search across many disks making only 2 key presses for each disk you insert.

FILEX - This program will make an export file of your directory and WSTAT information for import to ARCHIVE. This gives you an instant file/media database. File extension is made a field (doc,aba). If available file creation date and size are in the database. Dates are yy/mm/dd format for sensible selecting and ordering. You can build your database at a rate of over 1000 files an hour (faster than a 747). The next program makes any knowledge of ARCHIVE unnecessay in using your database.

DBEasy - This is a database manager that works as a front end or shell for ARCHIVE. It runs within ARCHIVE but you work from menus and need know nothing about ARCHIVE commands. Most of ARCHIVE's awesome power is at your finger tips. DBEasy creates and manages databases for many different applications. It keeps a log file of all your databases and allows you to swtich between them. Your FILEX file database can be just one of many databases you might want. Databases for addresses, expenses, income,tapes,stamps,books,or whatever can easily be created and managed. You can insert, alter, delete, select, order, find, search, locate, display single or multiple records, print records, partial records, mailing labels to a file or printer, do simple sums, export to ABACUS for more serious calculations. As a stand alone program DBEasy sells for $21.95.

This trio is ready to bust your chaos for $29.95 on 5 1/4 or 3 1/2 DSDD or $33.95 on 2 microdrives (specify if your QL is expanded). Order from:
Wood and Wind Computing : Bill Cable : RR 3 Box 92 : Cornish, NH 03745

RELEASING PRINTER POWER FROM A QL

Peter Hale, P.O. Box 8763, Boston, MA 02114

Many with a **QL** do not know how to get the most out of their printers. This is particularly true of those using QUILL who would like fancier documents, but feel they are limited to the enhancements (highlights) provided in QUILL (High & Low Scipt, Bold and Underlined).

This article describes (in possibly excessive detail) how to get the most out of a printer from within a QUILL document. The road to delight may seem a little untidy, but the printer power released from within your **QL** will be more than you could get from all but the most powerful and complicated word processors on other computers.

As illustration we will refer to the **QL** printer, partly because so many people have this printer, but also because it uses Epson printer codes and therefore has direct application to any Epson compatible printer.

If you understand QUILL documents, printer codes and the use of install_bas, go immediately to TABLE I and the section USING PRINTER CODES.

THE QUILL DOCUMENT

As viewed on the monitor screen the QUILL file shows the effect of embedded (invisible) codes in representing text. For example, pressing F4 then B changes subsequent text to a different color that represents a bold face to the text to be printed. Pressing F4 then B again releases the color and returns it to the original. But no one sees any specific character on the screen.

The code for bold is QUILL-specific. It is not visible on-screen but is in the _doc. Actually there are two different codes: one to turn on the bold highlight, the other to turn it off.

When printing a QUILL _doc, you have noticed that drive 1 on your setup will whirr. This is QUILL searching for a file called printer_dat which has data to change (translate) QUILL's own codes into codes that can be understood by the printer.

Thus, printing a document from within QUILL is a three-part exercise (as it is with any other, lesser wordprocessing program):

1) The typist prepares the QUILL _doc by invisibly embedding codes in the document through judicious use of the F4 key and its parameters.

2) The printer_dat file (otherwise called the printer driver) translates embedded codes into ones understood by the printer. The values in a given printer_dat file filter the QUILL _doc file on its way to the serial port, changing QUILL codes to printer codes.

3) When the printer receives codes in a "language" it understands, it changes the printer font or enhancement that will apply to printing subsequent text.

OK. Got that? If not, try re-reading it because it is important to understanding what follows.

PRINTER CODES

We will use the **QL** printer manual for specific references. Some will cite it as one of the more obfuscating documents in computerdom. Those who accept this canard have lived a sheltered life, unexposed to other printer manuals, all of which were written by summa cum laude graduates of the IBM school of technical writing.

As imperfect as the **QL** printer manual is, it is really very good. Like other manuals it lists the different codes (often called commands in other manuals) and what each does. In the **QL** printer manual there is a table on pages 67 and 68.

All codes are expressed in one of three ways: Symbolic (character representation in a format left over from teletype days), Hex or Decimal. The three are interchangeable. [Some printers, such as the older Mannesman-Tallys, have unique codes, but we are talking here about Epson compatible printers.]

The codes themselves are generally non-printing characters or start with a non-printing character. They can be represented symbolically or by decimal or hex digits through install_bas. For examples see pages 4 and 6 of the Information section of the **QL** manual itself.

The table in the printer's manual lists commands,

briefly describes each command's function, and refers to the page in the manual where you may or may not learn more about its use.

Most printer codes are preceeded by ESC (in decimal: 27, in hex: 1B). Some, such as condensed, double-wide and form feed have single codes.

Printer command codes with ESC are followed by a letter or other non-numeric character, and possibly a third and fourth numeric character.

When a string of characters arrives at the printer and one of the codes is present, the printer reads the codes. If the code is ESC, it knows to pay attention to the characters that follow until they no longer make sense as printer commands. Then the printer treats subsequent code as characters to be printed in the commanded way until another command arrives telling it to do something else.

If we could place other codes within a QUILL document, we could release the power of the printer, so pay attention to what follows.

USING INSTALL_BAS

The SuperBASIC program install_bas that came with QUILL enables us to insert codes in a QUILL document to access features built into the printer.

The codes will be visible on the QUILL screen as characters from the **QL** character set, but will not be sent to the printer head. Before arriving at the printer, through the magic of translation, the character will be translated into printer commands (control codes).

Thus we will choose characters that are not normally part of English text. These are characters accessed by holding the CTRL and SHIFT keys simultaneously and pressing one of the alphabetic characters. The characters resulting tend to be Greek or Scandanavian ones rarely needed.

The reason for install_bas is to modify the file install_dat (a collection of data about codes for a number of printers) and to create printer_dat, the working data file for your specific printer.

Load and run install_bas in the usual way. It must be on drive 1 on a medium with install_dat, printer_dat and a working copy of QUILL.

It takes time to load, then you must specify the drive on which installation and driver data are kept. This is usually drive 1 since QUILL defaults to drive 1 for printer_dat.

Next, the prompt asks if you are using a standard serial port (ser1 or ser2) to the printer. This is the choice even if you have a parallel printer but are using a parallel interface cable. The option for a non-standard serial port or a parallel port only applies if there is a special port for PAR such as is found on a Super QBOARD disc controller.

It takes a few minutes for the **QL** to organize data from the install_dat and printer_dat files, then the screen presents a list of printers and notes the most recently installed driver.

We won't repeat instructions for installing printer drivers that are so ablely presented on pages 3 to 7 in that section of the **QL** manual called Information - there isn't space here.

Instead, we will briefly step through the process of modifying an EPSON FX-80 driver. On page 6 of the Information section the right-hand column of the table is a close approximation of the FX-80 driver, except that the port is ser1 and the preamble code should spell ESC in upper case characters if it is to work.

Move the cursor over EPSON FX-80 with the down cursor key and press F1 to copy it. Then move the cursor to the copy and press F2 to edit it.

The cursor will be over the driver name. Press a right or left cursor key to change it, then type a printer name (up to 14 characters) and press ENTER.

The other lines are translates even if they don't admit it. The ones from PORT to SUPERSCRIPT OFF are dedicated and handled differently from those specifically called TRANSLATE.

The PREAMBLE CODE shown is ESC,@,ESC,R,NUL. On an FX-80 printer this resets the printer to a default state and selects the USA character set. ESC,@ is the common reset code for almost all printers, but the **QL** printer has no optional

USING PRINTER CODES in QUILL

Using the power is simple. Whenever you wish to use an enhancement not found within QUILL, use one of the Translate codes we have devised by inserting it as a text character when a change in printer function is desired.

Functions can be concatenated (chained) to achieve a desired effect. Thus double-wide, condensed, elite is theoretically possible simply by preceeding the text that you desire in that format with ÖŠO. When you wish to terminate that effect, simply type θ (Control-Shift N) to return to normal (pica, 10 pitch) width.

Some functions are not explicitly provided in the TRANSLATE codes developed here. You can construct your own with the « (Control-Shift X) command. A very useful one is «xl, which turns on the NLQ or LQ mode of any Epson compatible printer. Use «x0 to return to draft mode.

If you prefer Double-strike to NLQ, try «G («H turns it off). For real quality, albeit at a slow pace, combine NLQ and Double-strike.

You are on your own from here as to what features you want to explore, but there are some WARNINGS!

First, when inserting these new control codes within QUILL text, QUILL thinks they are printable characters. Thus if the code is the first character in a paragraph, QUILL performs word wrap and justification as if the code were printable. It's not, so the output on that line shifts one or more characters to the left, giving a ragged right edge to the paragraph.

The common solution is to insert the codes in what is otherwise a blank line between paragraphs or only at the end of a paragraph in the blank spaces remaining. Termination codes are less often a problem since they generally come at the end of a paragraph where there are no more characters to print.

Second, inserting codes within a line so that one or more words are in a contrasting highlight, as is done when using italics to indicate a foreign word is tricky. Changing pitch within a line or anywhere is even trickier, *n'est-ce pas?* Ñn'est-ce pas?ł

QUILL does not know that pitch has changed when it formats text. For that you would need text^{67}.

The solution to that is to treat lines that have custom enhancements as separate paragraphs with wider right margins. When changing pitch within a line or a document, some trial and error with sample print outs may be necessary.

Third, proportional spacing is a simple way to increase the text on a given page by about 10 percent. Characters such as i and I take less linear space than m or n. It is not recommended with right justification since there will be a ragged right edge. To take advantage of the extra word count extend the right margin 10 percent.

Finally, none of these tricks will work unless a copy of the printer_dat file is in drive 1 when QUILL begins to print. You learn the meaning of frustration if, after all this work, the document ends up with a batch of garbage instead of the expected enhancements.

* * * * * * * * * * * * * * *

Those who find that using install_bas is harder than they like can get custom copies made for their printer from EMSoft. The charge is $5.00.

With the five dollars send a disk or microcartridge with a working copy of QUILL (or QLWP), install_bas, install_dat and printer_dat. Include a photocopy of the pages in your printer's manual with the printer codes in summary form.

On the returned disk, you will receive a _doc file demonstrating the printer's power.

As another service to disk drive users, EMSoft will convert your PSION suite to default to flp_ rather than to mdv_. Send a disk with a direct copy of each of your four PSION programs and install_bas and $5.00. A special datesetting boot with the ability to select any of the PSION suite will be added.

Get both services together for just $8.00.

Send to:
EMSoft, P.O. Box 8763, Boston, MA 02114

character sets. On a **QL** printer, change the PREAMBLE CODE to ESC,@ so that it resets whenever a new document is printed. Type ESC,"@ then ENTER. It should look like ESC,@ with no ".

Why the " before the @? Symbolic codes may be entered directly in CAPITAL letters. The next part of the command is separated by a comma. The @ is preceeded by " since it is not symbolic code but is needed as part of the command.

You could enter @ in decimal code (64) or even do both parts in decimal by typing 27,64. When you press ENTER, it looks like ESC,@.

Also change the POSTAMBLE CODE to be FF, if your printer does not automatically Form Feed after printing. (For fun, put in FF,BEL so the printer signals when finished printing.)

Now move the cursor to the Translate lines. If you have a **QL** printer, use the right cursor key to remove the TRANSLATE1 and press ENTER. All other Epson compatible printers require this line so that the £ sign prints correctly.

In the next 8 TRANSLATE lines insert codes that will permit access to virtually all the printer's power. First add the capacity to send the ESCape code to the printer. With it we can manufacture most other control codes. Then add single keys that will allow use of condensed, double-wide, elite, italic and proportional printing.

[Note that older EPSON compatible printers may not be able to do proportional or italic printing - check your manual.]

In TRANSLATE2 press the right arrow then type "«,ESC. (the character « is found with Control-Shift X, a mnemonic for "Xscape"]. Press ENTER. The value for TRANSLATE2 should be «,ESC.

Henceforth, whenever you insert « in a Quill document, it will be translated on its way to the printer as the ESCape code (decimal 27), and the character immediately following it will be perceived as an instruction to the printer. More on this below in USING PRINTER CODES in QUILL.

See TABLE I for what to put in each of the other 7 TRANSLATES. We have left TRANSLATE10 free for you to design your own specific code.

TABLE 1

Translate Code	What you type	Control Shift Key	Function
2	"«,ESC	X=«	Send ESCape to printer
3	"ö,SO	D=ö	Start double-wide pitch (5/in)
4	"É,SI	C=É	Start condensed pitch (17/in)
5	"O,ESC,"M	E=O	Start elite pitch (12 char/in)
6	"Ñ,ESC,"4	I=Ñ	Turn on italic feature
7	"µ,ESC,"p,SOH	P=µ	Start proportional pitch (11/in)
8	"θ,DC4,ESC,"W,"0,DC2,ESC,"P	N=θ	return to Normal pitch (10/in)
9	"ϕ,ESC,"p,"0,ESC,"5	R=ϕ	Release italic and proportional

Note that the choice of Control-Shift key has mnemonic value - i.e. Control-Shift P starts proportional pitch and Control-Shift R releases it. Having just one "Release" key would be nice, but install_bas only allows 10 codes per translate.

Further, Control-Shift N returns the printer to Normal pitch indiscriminately of which pitches were set. Thus if a section of the document were set for double-wide, condensed and you wished to change to condensed, it would be necessary to release both then reinstate the condensed. Piggy-backing the release codes is a function of the limit of 10 translates in the standard install_bas.

See the text on Using Printer Codes in QUILL_docs.

**** M. S. D. O. S. ****

FOR THE SINCLAIR QL

TERMS - TERMS! Let us see if we can better understand the ambiguities so that we can use our systems to better advantage.

"OS", in computer talk, means *"Operating System"*. Preceed "OS" with "D", and "DOS" means "Disk Operating System". "MS-DOS" means Microsoft Disk Operating System.

The DOS consists of a group of programming utilities (or tools) used to interact between the Operator, The Computer, and a MASS STORAGE DEVICE- a disk drive. "MS-DOS" was created by The MICRO SOFT Corporation for IBM Computers. "QDOS" is the system used for the Sinclair Computer, and LKDOS is the Disk Operating system created by Larken Electronics for the TS-2068. *Essentially, all of the DOS perform the same functions*, though some perform more elegantly.

The original MS-DOS, created by Microsoft for the early IBM computers, was programmed for a computer that had a maximum of 128K of internal memory, and some of that was reserved for internal computer "OS" (operating system). Through the years computers were designed to address (use) more memory, and other versions of MS-DOS were released that would take advantage of more memory capacity. The first MS-DOS was quite limited, because each of the programming utilities took up memory space when the utilitys were loaded into the computer's own memory.

The Sinclair QL engineers reserved a portion of the QL's internal memory to store the DOS utilities. Then Cottage industry developed Disk Drive interfaces and stored the Floppy utilities in ROM additions. In some respects Sinclair computers' DOS are more efficient than MS-DOS because their DOS utility programming is stored "IN PERMANENT MEMORY", and thus is faster in operation than MS-DOS which requires the DOS utility to be "fetched from disk to Computer Memory".

But there are disadvantages of "fixed Operating Systems". One major disadvantage is that each subsequent "version" of the DOS requires hardware change- a new EPROM to be installed. And, a fixed memory chip poses problems to the independant programmers who would like to offer improvements to the DOS. But to make such improvements would require the programming of EPROMS to install in the DOS hardware circuit boards.

USER LEARNING

Each DOS is designed for User Interface between the person, the computer, and the disk drive. Most of the disk operating systems are actually simple to use, if one will study the available manuals. The first step is to try to understand the objectives of the DOS programmers, principle of which is to transfer information between the computer and a mass storage device, the disk drive. The user is furnished with a repertoire of BASIC commands to cause planned actions to take place. When one learns these simple Basic commands, the "Human Interface" becomes efficient. Infrequent use of the DOS makes the operation seem to be complex because each simple task requires the operator to refer to a manual before entering the basic command. Imagine how difficult it would be to drive an automobile if one had to study the manual in order to find where the brake pedal is located! When one drives behind a "Driver's Ed" vechicle, the need for operator PRACTICE is evident. Practice promotes efficiency.

Some of us become accustomed to one DOS and are reluctant to change to another because of the seeming complexity of a strange new set of Basic Commands. Actually our old and familiar group of DOS commands may be more complex than the new DOS that is being avoided. An example of this is my own reluctance to tackle MS-DOS, which I later found to be less complex than my favorite TS-2068 LKDOS. The adage, "Old dogs wont learn new tricks" applies. Actually this old dog is learning new tricks and finding the process to be enjoyable. But the process requires a reference book, some study, and most important, PRACTICE and ERROR CORRECTION. Practice is needed for the DOS commands to be remembered for proficiency of operation. Progressing from Micro Drive commands to DOS (or MS-DOS) commands is a small step for QL users.

MS-DOS, and the SINCLAIR QL

I find QDOS, augumented with the Trump Card

Tools (TK2_EXT), to be more efficient than MS-DOS. But there are many advantages to be gained by learning and using MS-DOS. Generally, programming support for the QL is declining in England. The picture in the USA and Canada is improving with such new programming as is being done by EMSOFT, Wood and Wind Computing, and a few others. But the market potential for QL and TS-2068 software is on the decline.

The largest library of computer software is the MS-DOS market, where new titles are constantly appearing and there is a huge hoard of useful public domain libraries. Also, programming for MS-DOS seems to be where the most opportunity exists for qualified programmers. Software support for the QL and TS-2068 is definitely on the decline.

Even so, my large inventory of TS-2068 and QL software is so valuable and productive that it would be foolish of me to discard either of these fine computer systems. Eventually though, one can reach a saturation point with computers and the space sharing with other members of a family.

The answer may be in acquiring a portable MS-DOS computer to use in conjunction with my Sinclairs. Then programs and data files can be shared with the QL, and Data Files shared with the TS-2068 and Z88.

Two MS-DOS Emulator Softwares

Last issue Update presented a nice review of *"THE SOLUTIONS"*, by Dick Wagner. This first "Imulator" software for the QL marked the beginning of the QL's use of software that is designed for MS-DOS operation. I recently acquired a new QL software called "PC CONQUEROR". Both Solutions and PC Conqueror are MS-DOS emulator softwares produced by Digital Precisions Ltd., of England. PC Conqueror is their latest release. I have both titles and am greatly impressed with PC Conqueror. It comes with a disk having MS-DOS version 4.1 which has some modifications designed especially for operation with the QL. Both the disks having the PC Conqueror software and the one having MS-DOS 4.1 are in 80 track 720K format, which relieves one problem with the earlier Solutions software which was in 40 track 360K format.

I have used PC Conqueror and find it to be fairly easy to operate. Once PC Conqueror (or The Solutions) Software does the initial job of reconfiguring the QL to operate as a MS-DOS system, the task is turned over to the operator who must use MS-DOS Basic Commands to load and operate MS-DOS software. While the use of MS-DOS "Operator Basic Commands" is required, they are no more difficult to master than are the DOS commands for the QL or the TS-2068. One just needs to learn the MS-DOS commands and *practice* to gain familiarity.

MS DOS CONCEPTS:

MS-DOS consists of a group of program utilities that are stored in disk. When one needs to perform disk functions, such as FORMAT a Disk, or Copy Files, or LOAD a Data file. etc., an MS-DOS Basic command is used. The operator's use of the DOS Commands results in the appropriate MS-DOS utility program loading to the Computer's memory and the function being performed.

Compatability of Software

One needs to understand that *all IBM Compatables are not completely compatable with each other.* Compatability depends upon several factors and are mostly involved with the programming of a software for the various IBM systems. There are several Monitor Systems for IBM systems (Monochrome, EGA, CGA, etc.). Generally, software that is designed for high resolution screen dumps to paper will cause incompatability problems *between IBM systems* as well as with the Sinclair QL. So, a QL user cannot expect that all MS-DOS softwares will operate with either of the two Emulators. But many MS-DOS softwares are programmed to operate with "the lowest configuration system" and should work with the Emulated QL.

QL DISK DRIVE CONFIGURATION FOR MS-DOS

MS-DOS is capable of operating in IBM systems having single disk drive, two disk drives, or from 1-4 disk drives and a Hard Drive. The configuration of the disk drives and their format depend upon the IBM Disk Controller card in use. There at least seven disk configurations used with IBM and IBM compatable systems. *Only two of these configurations will work with Sinclair computers.* So, it is important for QL users to select the type of disk drives that will work with the QL.

The two Digital Precisions softwares mentioned

AN INTRODUCTION TO PC-CONQUEROR

By: Bob Hartung, 2416 N. Co. Line Road., Huntertown, IN

This *MS-DOS Emulator program* is by Digital Precision LTD and is my first hands on experience in the MS-DOS environment. So, this cannot be an in-depth review of MS-DOS. The sheer mass of books written about MS-DOS and its application softwares show the emmensity of the subject. However, my impressions as a rank beginner may give some indicators, if not benchmarks, to those who may be considering buying PC CONQUEROR or to those who are trying to learn PC-C and MS-DOS.

I'm sure that those who acquire PC-C just for the learning experience in another computer environment will find it as fascinating as I have in the short time that I've been exploring it. Those who use the IBM system in their work place should be able to create files with their QL that will run happily on an IBM or compatable. PC-C also includes a program called "XOVER" which can transfer files from MS-DOS disks to QDOS disks or to RAM DISK and vice versa-- without loading the PC Conqueror program. Also XOVER will rename and delete files and do text conversion between MS DOS and QDOS disks.

Speaking of books, David Lien's MS-DOS ADVANCED APPLICATIONS is available at Radio Shack, and is a good source of info about MS-DOS. Lien's book is written for the 3.20 version of MS-DOS. Another source is Microsoft Press "Quick Reference Guide To MS-DOS Commands", which include those new commands found in version 4.0. (PC Conqueror is designed around version 4.0 and includes a MS-DOS version (4.1) modified for the Sinclair QL. Another good reference is "GW BASIC FOR BEGINNERS" by Abacus publishers. The PC Conqueror disk contains an 80K version of GW BASIC which is initialized by entering the command <GWBASIC>. You break out of GW Basic by CTRL ESC. Return to MS-DOS is via entering the command <SYSTEM>. These commands are not covered in the manual, but are covered in the GW BASIC reference mentioned.

The PC Conqueror Manual is 85 pages. It begins with a discussion of what the emulator is and does and then states that even with the hefty cost of the complete PCC package, the cost is but a fraction of buying a PC Clone. And, those who already have a PC or Clone, or one available at work, can use their MS-DOS system disk, thus saving the extra cost of the 4.1 version that is supplied with the PCC package.

What PC-C does is to mimic as nearly as possible in a QL the responses and capabilities of a PC or other computer running in the MS-DOS environment. The concept of MS-DOS itself is is an approach toward having one system of comunications, file handling, and device control, that is compatable with all other computers that are designed to work under this same environment. There are hardware differences and subtle changes in the ROMs of CLONE systems made to avoid patent and copyright infringement. Thus some software written for a "compatable-clone" may not work in an IBM PC, XT, AT, and vice versa. The QL with PC Conqueror is no exception.

SPEED: Considerable loss of speed of software operation is inevitable when an emulator or intermediate intrepeter is needed to translate the native language of one computer system to that of another. The Manual recommends that LIGHTNING SPECIAL EDITION be installed with PC Conqueror. This will speed up screen file handling and number crunching operations. Such increased speed may not be apparant for operations not involving those two functions. In particular, I found no noticable increase in speed in the display of listing entries in the GW-BASIC mode, which is VERY SLOW. This is likely because the keyboard scan must first be intrepeted for GW Basic, then MS-DOS must intrepet GW-Basic, then finally, PC Conqueror must intrepet and translate MS-DOS to QL Dos equilivant instructions. The MS-DOS Graphics functions, which are similiar to LOGO or Turtle Graphics, also responds quite slowly, although the screen resolution is excellent.

The PC-C Manual strongly recommends that the MS DOS Shell and ANSI not be used because they slow down the processing even more. Most interactive game programs run far too slow to be much of a challenge except for those of us having geriatic reflexes. Also, thee MS-DOS system disk must be accessed for many commands to load in the appropriate routine which further adds to the lag time.

Overall however, since a keyboard buffer is provided, the operational speed of MS-DOS programs should be fairly acceptable with applications such as spreadsheets that require mostly KBD input, and even with word processors and data base programs- if you can remember that you may be typing well ahead of what is currently on screen.

It is simple to follow the easy instructions for back up and work copies of PC Conqueror and MS-DOS Systems disks. Then if you have an 80 track 720K DSDD system the manual says "It is simple as 1-2-3 to get PC-C and an application MS-DOS program running. With my dual 80 track drives I did not need to make any changes to load PC-C and the MS DOS systems disk supplied. (Alternate 360K disks may be supplied for both if you have 360K drives.) Customized work copies of PC-C and MS-Dos disks may be made by using the "Configure" program in the PC-C disk. Such customized copies would be for non-standard configurations or changes in the drive defaults, KBD scanning, printer allocation,

will work with the QL System that has either one or two disk drives, and format capability of either 40 track 360K or 80 track 720K capacity. The disk drive can be either 5 1/4 inch or 3 1/2 inch. The key is the FORMAT capability. All Sinclair Computers are designed to use "SHUGHERT" type disk drives that conform to a standard format called "Shughert". IBM controller cards use this standard for their 360K and 720K drives, but different format standards for their 1.2 mgbt and 1.44 mgbt format.

There may be a capability of using Hard Disk with the QL, but I am un-aware of such detail at this time.

WARNING: If you need to buy a disk drive for your QL, consult with your Sinclair Support Dealer. Our Sinclair dealers know the type drives that are compatable with our computers. Also, the cable fittings for IBM and QL computers are different and the correct fittings are known by our QL suppliers.

It is most likely that your existing disk drives will be satisfactory for operating MS-DOS software with the two Emulator softwares mentioned. Solutions sets up the QL to read, Format, and operate in the 360K format *with the QL 80 track drives, or with the QL and 40 track drives (either 5 1/4" or 3 1/2"). Conqueror sets up the QL to use the QL's 80 track 720K format in the MS-DOS environment.*

Single side drives: There are some disk drives in use that read and write to only one side of the diskette at the time. While the two Emulator softwares can be copied to these single side diskettes, the operation of MS-DOS softwares usually requires more "continuous" read and write capability than the 180K capability of these single side drives. Single side drives should most likely be replaced with 80 track DS-DD 720K drives for the best results.

QUESTIONS To Be ANSWERED:

1. Will the speed of operation of most MS-DOS software with the QL be satisfactory?
2. Will the success of Imulation of MS-DOS software be widespread and include most of the MS-DOS software titles?

Update Magazine's next issue will bring a detailed review of this new software, PC Conqueror. It will be interesting to learn if PC Conqueror bridges the gap between MS-DOS and the Sinclair QL sufficiently that it will not be necessary to actually own another computer that is designed for MS-DOS operation. My impression is that it will serve that purpose. But, I will postpone my decision about buying an MS-DOS portable until the results are in about the effectiveness of the PC Conqueror Imulator Software.

For myself there will be a certain amount of "pride in doing it" if the $140 software will give me about 70% or more MS-DOS compatability without having to buy a MS-DOS portable.

The decision whether to depend upon QL Emulator software or to buy an MS-DOS portable involves two important results: The effect on one's budget, and the amount of SPACE required for dual computer systems. PC Conqueror costs about $140.00 while a new MS-DOS portable runs between $650.00 and $7000.00.

If one adds another computer, even a portable, the Computer desk will need 'stretching' to accommodate another computer system. (My seven foot desk may need to be nine feet). Then there are the raft of new Computer manuals to add to the library to study.

So, the results of a comprehensive review of PC Conqueror can be quite valuable and have quite an impact upon one's future computing plans if one is determined to start operating in the MS-DOS environment. Watch with me for the coming review in Update.

QL, Z88, AND TS-2068 DATA TRANSFER

It is not possible to operate MS-DOS software with the TS-2068 or Z88 computers, but there is capability to interchange data files between these computers. Both the TS-2068, the QL, and the Z88 can be used in coordination with each other and with MS-DOS computers to *share data products.*

A comprehensive article in the next Update issue will detail the transfer of data files between computers of all kinds.

Most TS-2068 Basic programs can easily be edited and run in the QL by converting the program lines to ASCII, transfering the file to the QL to be run with the <MRUN> command.

It really is quite simple to transfer data files between computers that are in close vicinity, as "on the same desk or in the same house". A simple two wire hook up with Short IN-OUT basic programming does it. The next issue of Update will have a detailed article about Cross Using data files between computers of all kinds. -*BJ*_

TRUMP CARD USER's GUIDE

by

Tim Stoddard

INTRODUCTION

I have been using three TRUMP cards now for about a year and a half now, and I have noticed that there is no real 'USER GUIDE' available. The very small manual that comes with the TRUMP card outlines the syntax (sometimes incorrectly) but gives very few examples. These series of articles will bring to light some of the very powerful features of the TRUMP CARD and TOOLKIT II via real usable examples. The articles may be assembled into a user guide at some future time, if enough interest is shown.

I welcome all critiques and suggestions. I want this user guide as accurate as possible. Feel free to write via UPDATE MAGAZINE or my home. If you wish an answer please include S.A.S.E. envelope.

Tim Stoddard
85-48 66th Road
Rego Park, NY 11374-5212

You can also reach me via CompuServe (73127,2664) or Genie (xtx53868).

NETWORKING

Perhaps one of the most useful and powerful feature of the QL is the built-in networking facility. The QL's ROM however contains many bugs that make using the network difficult, at best. Qjump's TOOLKIT II (refered to as TK2 hence) corrects the bugs and makes the QL's network very useful.

First I should describe my set-up, which is in use daily. A total of three QLs are networked over about 75 feet of bell wire.

QL station #1, where I do most of my work, consists of a 768K TRUMP, 2400 baud modem, dual TEAC FD235 3 1/2" drives, Tandy CGP-220 color ink jet printer, and a QL Vision monitor.

QL station #2, located in my shop is used to isolate printer noise (my wife hates the noise of those dot matrix printers), consists of a 768K Trump, TEAC FD135 3 1/2" & TEAC FD-55F 5 1/4" drives, EPSON LQ500 on ser1, EPSON FX286e with a scanner attachment on ser2, Magnavox 80 monitor.

QL station #3, also located in my shop, is an 'open-frame' QL where I do hardware experiments and new product evaluations, consists of just a 128K QL, TOOLKIT II ROM, and a QL Vision monitor.

SHARING RESOURCES

After a reset the QL will be set to a default station assignment of 1. This is fine for my work station but the two shop stations must be set to different station numbers to avoid conflicts. This is done with the command:

net (station number)

Once the station number has been assigned you can allow access to your station's resources (serial ports, drives, even RAM) by other stations with the command:

fserve

For instance my shop QL (station #2) is set-up in the boot file with the following commands:

```
TK2_ext          ( enables TOOLKIT II )
net 2            ( sets it as station #2 )
fserve           ( allows resource access by stations
                   1 and 3.)
```

PRINTERS

In order to use these remote resources, just proceed the desired device with the station number it is attached to. For instance, on my system, to use the LQ500 from the main QL I would send the output to n2_ser1. Page 2 of the TRUMP user manual touches on this **incorrectly!** It states that instead of using the 'default' printer option within QUILL you should key in 'n1_ser1' or, in my case, to print to the LQ500 I should key in 'n2_ser1'. If you try this (go ahead and try it now) you will end up with the file 'n2_ser1' on the default data drive! So what do we key in? The Psion programs look for the underscore character as the first character and then assumes a device name follows. So the proper device name that the Psion programs look for is:

_n2_ser1

***** MANUAL CHANGE *****
PAGE 2, 4th paragraph, second to last sentence change **N1_SER1** to **_N1_SER1.**

***** NOTE *****
It appears that only the PSION programs look for this begining underscore. All other programs accept the **N1_SER1** format.

The entire squence for printing to the LQ500 from Quill would be:

```
<F3>             command mode
<p>              print
<ENTER>          default current
<ENTER>          default whole document
_n2_ser1         overide the driver default and send
                 output to station #2 ser1 device.
```

If you wish to always use that destination (as I do), you can change the driver with the install program. After you start the program it will ask you if the device is a serial device (Press <ENTER>) or the device is a parallel or non-standard serial port (Press <SPACE>). **PRESS the <SPACE>** bar. Select your printer driver with the arrow keys and press the <F2> key to edit. Use the down arrow to select the port option and press the right arrow key to change. Now key in the station number with the device name in the same format as we did previously. Don't forget this is a PSION printer driver so use that leading underscore! Key in:

_n2_ser1 for my set-up.

DYNAMIC PRINTER BUFFER

This facility works very nice but does have some limitations not described in the manual.

PRT_USE like the other 'USE' commands in TK2 will match a 'device string' to a 'usage string' for any device calle. The syntax of this command is PRT_USE [usage],[device]. The

default at TK2 initialization is **PRT_USE PRT,SER**. TK2 will substitute any device names containing 'PRT' with 'SER' before giving the device name to QDOS. So if you were in QUILL and wanted to send output to your printer on SER1 buffered, you would key in the sequence:

<F3>
<p>
<ENTER>
<ENTER>
_PRT1

TK2 would see the 'PRT' and substitute it with 'SER' and open the SER1 port to take output from the print buffer where it has stored the document. The end result the user sees is that the cursor has returned much sooner and you are able to continue work while the printer is printing away.

TK2 uses a text 'trap' facility in it's USE commands (PRT_USE, PROG_USE, ETC). ANY device name used in the TK2 environment will be checked against all of the 'USE' variables. Note that this is strictly a text match and does not have to be a real device! This is why sending output from QUILL to 'PRT1' works. You could use almost any name. For instance:

PRT_USE buffered,ser

will allow you to be descriptive from QUILL:

<F3>
<p>
<ENTER>
<ENTER>
_buffered1 (or _buffered2)

will send output VIA the printer buffer to SER1 (or SER2). These names will, of course, also work in the printer driver itself since TK2 will trap ALL device names before they go to QDOS. Try it now! Re-install your QUILL printer and use **_buffered1** as the 'port' name in the driver.

***** THE LIMITATION *****
PRT_USE will not accept network names!! For instance:

PRT_USE PRT,N2_SER **WILL NOT WORK**

It's too bad too! It would be a nice command. There is a way around this. On my set-up I use the following command in the boot file for station #2:

PRT_USE SER,SER

This will buffer any device calls for SER1 or SER2 transparently since it substitutes 'SER' for 'SER'. This includes device calls VIA the network! Since my device driver on station #1 is set-up to send output to **_n2_ser1** and station #2 buffers any device calls to SER1, all output from QUILL on station #1 is sent through the network to station #2 where it is buffered and then sent to SER1! All invisible to the user. I get my cursor back at station #1 fairly quickly while station #2 prints out my document in another room where printer noise is not a problem.

Can you send graphics through the network and then through the printer buffer? YES. I send output from several graphic programs including: EYE_Q, THE PAINTER, PROFESSIONAL PUBLISHER, PAGE DESIGNER 2, and TK2's built-in screen dump facility SDUMP. Transfer through the network is about the same speed as saving the file to microdrive which is considerably faster than waiting for your cursor while printing a screen dump or Desk Top page locally!

Finally, the command **PRT_ABT** works as the manual states: it cancels the currently printing file. The command does force a form-feed thus allowing any subsequently queued files to start on a new page.

FILES SYSTEM

File system handling via the network is quite straight forward, however, the example given in the User Manual is misleading.

Access to any other QL's (running FSERVE) directory devices is quite easy. You simply preceed the path name with the station number. For example to get a directory of station #2's disk:

dir n2_flp1_

Simple! To copy a file from station #3 to station #1:

copy n3_flp1_filename,flp2_filename

for a lot of files:

wcopy n3_flp1_ to flp2_

There is a command available in TK2 to simplify nameing conventions, especially for end-users in a large network having no knowledge of QDOS or TK2: NFS_USE. It is similar to the other 'USE' commands in that it substitues physical device names for a logical name. It is different in that it allows a list of up to 8 physical device names to be substituted for the logical name and a trailing number of 1 to 8.

The example from the manual was:

NFS_USE mdv,n2_flp1_,n2_flp2_

TK2 will now 'trap' all device calls containing 'mdv' and substitue the logical name. For instance:

dir mdv1_ (after executing the above NFS_USE)

will give you the directory of n2_flp1_.

dir mdv2_

will give you the directory of n2_flp2_!

Nice, but you'll now notice that you no longer have access to your microdrives! Substituting 'flp' for 'mdv' has the same affect.....you have lost access to your station's disk drives. There is a use for this, of course! For stations that have no drives or a number of stations that you want to limit access to only one set of drives, this is ideal.

The manual implies that 'USE' name must be a physical device .....not so! The boot file for station #1 in my set-up contains:

```
NFS_USE LAN,n2_flp1_,n2_flp2_,n2_mdv1_,n2_ram1_,
        n3_flp1_,n3_flp2_,n3_mdv1_,n3_mdv2_
```

To access flp2 on station #3:

dir LAN6_

TK2 traps 'LAN' and substitutes the physical device from the list matching the number following 'LAN' giving us a directory from the physical device n3_flp2_.

wcopy LAN8_ to LAN4_

is the same as:

wcopy n3_mdv2_ to n2_ram1_

but easier to understand and faster to type in from a user's point of view.

Although the manual states that only directory devices should be used, other devices will work. For instance:

NFS_USE LAN,n2_flp1_,n2_ser1

does work and printing from QUILL substituting the last option 'printer' with '_LAN2_' results in sending the output to n2_ser1_!

Editor's note: I am sure that the readers appreciate this first part of Tim's Trump Manual and we look forward to the next episode. My impression of the Trump user manual supplied by Miracle Systems is that it is "good for as far as it goes". After "blowing up" the pages exactly four times their original size the pages are 8 1/2 X 11", readable and carries a wealth of information that is given in very brief form.

We have always needed an in-depth expansion of the Trump manual to better learn and take advantage of the outstanding tools and procedures of the Trump card System. I highly recommend that ALL trump Card owners take their little manual to a copy shop and have the pages enlarged to full size pages. Then it and Tim's "Advanced Trump Guide" will become a complete reference.

Update will continue Tim's articles until he is finished with the expanded manual. The pages will be arranged so that there are no continuations or other articles mixed in. This way you can take the pages to a copy shop and build your manual as it is presented. Last pages such as this one can be masked off and the blank space used for notes. This series promises to be one of the most valuable references for Sinclair QL Users. _BJ-

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==========

THE BEGINNER'S MANUAL BY MIKE FINK WHICH IS SUPPLIED FREE TO HIS Z-88 CUSTOMERS, WOULD BE OF LITTLE VALUE REPRINTED HERE IF YOU DO NOT YET OWN A Z-88. IF YOU ALREADY OWN THE Z-88, THE ADVANCED MANUAL OFFERS USEFUL **HINTS** AND **TIPS** AND EXCERPTS FROM THAT MANUAL WILL BE PRINTED HERE BEGINNING THIS MONTH.

==========

I WILL BEGIN BY TELLING YOU SOME OF THE THINGS THE Z-88 CAN DO THAT ARE NOT COVERED IN THE CAMBRIDGE MANUAL.....

==========

1. YOU CAN PRINT DOUBLE WIDTH, ELITE, DOUBLE STRIKE, PROPORTIONAL, OR ANY COMBINATION OF THESE ALONG WITH THE ONES THEY DO MENTION.

2. THE PIPEDREAM SCREEN SHOWS 6, 12 CHARACTER COLUMNS A-F. YOU CAN ADD COLUMS, DELETE COLUMNS, CHOOSE THE WIDTH OF ANY OR ALL OF THE COLUMNS. YOU CAN ADD UP TO 676 COLUMNS!!!!!!!!!

3. YOU CAN INSTANTLY MAKE NEWSPAPER TYPE COLUMNS BY TABS.

4. YOU CAN DO MATHEMATICS INSTANTLY ON THE PIPEDREAM SCREEN WITHOUT MAKING A SPREADSHEET, OR GOING TO BASIC. THE NO. 676 IS THE RESULT OF 26x26. I DID NOT KNOW THE ANSWER BUT AS I WAS TYPING THIS, I NEEDED THAT ANSWER, SO I INSTANTLY FOUND A BLANK SLOT OR LINE, AND PRESSED ◆X, WHICH HI-LIT THE SLOT MY CURSOR WAS IN. I THEN PRESSED 26, WHICH MADE ITSELF VISIBLE ABOVE COLUMN C. THIS WORKING AREA ALLOWS ME TO WRITE THE INFINITE NO. OF MATHEMATICAL PATHS I DESIRE BEFORE I PRESS ENTER. AFTER ENTER, THE MATH CALCULATIONS OCCUR AND THE RESULT IS SHOWN IN THE SLOT YOU HAD THE CURSOR. I CHOSE TO WRITE 26x26 AS 26^2. 26x26 MUST BE 26*26 TO WORK. 26^2 MEANS 26 RAISED TO THE SECOND POWER, OR 26 SQUARED, OR 26 TIMES ITSELF; IN ANY CASE IT GAVE ME THE ANSWER I NEEDED IN LESS THAN 7 SECONDS, WITHOUT MY LEAVING THE SCREEN OR THE DOCUMENT I WAS WORKING ON.

5. I CHOSE TO CHANGE THE 72 CHARACTER WIDE SCREEN, TO A 61 CHARACTER SCREEN. I PRESSED ■ AND THE LEFT ARROW UNTIL THE VERTICAL ARROW IN THE COLUMNS CAME TO REST AT 61, ONE PAST E. I COULD HAVE CHANGED COLUMN A TO WIDTH 61 ALSO, BUT THE WORDS WOULD NOT AUTOMATICALLY WRAP AROUND UNLESS THERE WAS A PRINTED SCREEN CHARACTER IN THE NEXT SLOT, OR THE ARROW WAS MOVED TO THE RIGHT SPOT. SEE *INSERT ON WRAP-OPTIONS PAGE* ◆O

==========

THE PURPOSE OF THIS MONTHLY COLUMN IS TO HELP THOSE WHO OWN THE Z-88 AND TO ENTICE THOSE THAT DON'T, INTO BUYING IT. OF COURSE I HOPE YOU CHOOSE **DOMINO CUBES** WHEN YOU DECIDE TO BUY THIS WONDERFUL MACHINE.

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JUSTIFY SHOULD ONLY BE USED WHEN TYPING FONT CODES THAT DO NOT CHANGE THE WIDTH OF THE WORD! *JUSTIFY* WORKS ONLY ON THE TEXT TYPED **AFTER** YOU SELECT IT FROM THE OPTIONS PAGE....◆O. IT DOES NOT TAKE INTO ACCOUNT THE DIFFERENT SPACING OF THE WORDS THAT HAVE CODES THAT CHANGE THE SPACE *THEY USE*. THE ONLY CODES THAT ARE USABLE BY *JUSTIFY*, ARE THOSE WHOSE SPACE REQUIREMENTS DO NOT CHANGE WHEN THE CODE IS APPLIED; IE; *BOLD, ITALICS, SUPER AND SUBSCRIPTS.*

ALL OTHER CODES, INCLUDING PROPORTIONAL, REQUIRE MANUAL ADJUSTMENT. I HAVE FOUND, THAT FOR ME, IT IS EASIER TO **NOT** USE THE *JUSTIFY*, **IF** I AM USING CODES THAT **CHANGE** THE WORD WIDTH. PROPORTIONAL KILLS *JUSTIFY*.

THE MAXIMUM NO. OF CHARACTER WIDTHS FOR ONE PRINTER EDITOR IS 7. THEY ARE SHOWN AT THE BEGINNING OF THIS PAGE. TO DO THIS, USE THE ELITE.PE, WHICH IS DESCRIBED IN MY ADVANCED MANUAL, MANUAL **B**. ALL OF THESE INSTRUCTIONS APPLY

SPECIFICALLY TO MY SQUARE-DOT, C-130, 80 COLUMN PRINTER; ALTHOUGH THEY PROBABLY APPLY TO MOST ALL OF THE OTHER DOT-MATRIX PRINTERS AS WELL!!

THE FIRST STEP IS TO CHOOSE WHICH CHARACTER WIDTH YOU WISH TO USE FOR MOST OF YOUR DOCUMENT. THEN CHOOSE A TOTAL COLUMN WIDTH EQUAL TO THE TOTAL NO. OF CHARACTERS THAT WIDTH CAN PRINT ON AN 80 COLUMN PAGE, LESS 2 MARGINS. THE LEFT MARGIN YOU CHOOSE FROM ◆□, AND THE RIGHT MARGIN BY MOVING THE VERTICAL ARROW, (TO THE LEFT OF COLUMN F), TO THE NEEDED POSITION, WITH ■-->, OR ■K--. THE SCREEN STARTS YOU OFF WITH SIX 12 CHARACTER COLUMNS, ASSUMING YOU WISH A 4 CHARACTER MARGIN LEFT AND RIGHT, WHICH WOULD ADD UP TO 80 IF YOU USE NORMAL PICA WIDTH CHARACTERS. IF YOU USE NARROWER CHARACTERS, YOU CAN FIT MORE OF THEM IN THE SAME SPACE, BUT THE PRINTER WILL ONLY PRINT THE 72 SHOWN ON YOUR SCREEN! IF YOU WISH TO PRINT ON PAPER THE EXTRA CHARACTERS, YOU MUST INCREASE 72 TO WHAT YOU NEED. YOU CAN EITHER, INCREASE THE WIDTH OF ONE OR MORE COLUMNS, OR ADD MORE COLUMNS. IN BOTH CASES THE PAGE MAP WILL NOT LET YOU SEE THESE ADDITIONS, UNLESS YOU NARROW THE PAGE MAP. YOU CAN GO TO ■S AND CHANGE *MAP SIZE* ACCORDINGLY.

IF YOU WISH TO SEE 7 LINES OF TYPING ON THE SCREEN, INSTEAD OF 6, YOU CAN CHANGE BORDERS ON THE OPTIONS PAGE FROM Y TO N.

YOU CAN USE ITALICS AND BOLD AT THE SAME TIME ON A WORD AND STILL USE JUSTIFY. BOLD DOES NOT WORK ON ELITE NOR CONDENSED.

MORE NEXT MONTH!

```
  200 REM
  220 PRINT"SET SCREEN WIDTH TO 80 WHILE TYPING PROGRAM!!"
  240 REM
  260 PRINT"THE LEFT AND RIGHT APOSTROPHES ARE NOT SYMMETRICAL ON THE
150; YOU SHOULD USE   THE SINGLE APOSTROPE FOR BOTH. ON THE C-130, THE
 LEFT APOSTROPHE IS REACHED BY DIAMOND THEN APOSTROPHE."
  280 PRINT"THIS PROGRAM WILL PRINT THE Z-88 CHARACTER SET IF YOU USE
THE CLI-PE."
  300 PRINT
  320 PRINT"IF 9=85=UNDERLINE; 66=BOLD; 88=EXT.SEQ.; 73=ITALICS; 76=SU
BSCRIPT;    82=SUPERSCRIPT; 65=CONDENSED; AND 69=DOUBLE WIDTH"
  340 PRINT
  360 PRINT"TURN OFF SQUARE + P, TYPE GOTO (NEXT LINE NO), CHOOSE S, T
URN ON          SQUARE + P"
  380 STOP
  400 INPUT"                INPUT S = "; S
  420 PRINT
  440 P=OPENOUT":PRT.0"
  460 PRINT#P,CHR$(5)+CHR$(91)
  480 PRINT#P,CHR$(5)+CHR$(8)
  500 WIDTH(70)
  520 FORX=32TO126
  540   PRINTX;" = ";CHR$X;
  560 NEXT
  580 FORY=160 TO 163 STEP3
  600   PRINTY;" = ";CHR$Y;
  620 NEXT
  640 PRINT#P,CHR$(5)+CHR$(8)
  660 PRINT#P,CHR$(5)+CHR$(93)
>
```

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```
INPUT S = ? 8    8

 32 =    33 = !    34 = "    35 = #    36 = $
 37 = %  38 = &    39 = '    40 = (    41 = )
 42 = *  43 = +    44 = ,    45 = -    46 = .
 47 = /  48 = 0    49 = 1    50 = 2    51 = 3
 52 = 4  53 = 5    54 = 6    55 = 7    56 = 8
 57 = 9  58 = :    59 = ;    60 = <    61 = =
 62 = >  63 = ?    64 = @    65 = A    66 = B
 67 = C  68 = D    69 = E    70 = F    71 = G
 72 = H  73 = I    74 = J    75 = K    76 = L
 77 = M  78 = N    79 = O    80 = P    81 = Q
 82 = R  83 = S    84 = T    85 = U    86 = V
 87 = W  88 = X    89 = Y    90 = Z    91 = [
 92 = \  93 = ]    94 = ^    95 = _    96 = `
 97 = a  98 = b    99 = c   100 = d   101 = e
102 = f 103 = g   104 = h   105 = i   106 = j
107 = k 108 = l   109 = m   110 = n   111 = o
112 = p 113 = q   114 = r   115 = s   116 = t
117 = u 118 = v   119 = w   120 = x   121 = y
122 = z 123 = {   124 = |   125 = }   126 = ~
160 =   163 = £
```

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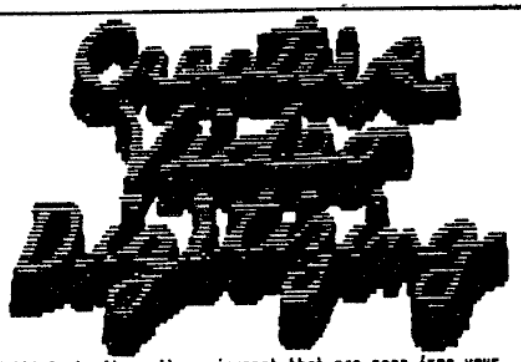

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NEWSLETTER

Memberships cost $18 per year, are good for 12 months, and include all privileges (access to libraries, group buys, etc.). A newsletter only subscription is available for persons living outside the Washington Metro Area and is $12.00 per year.

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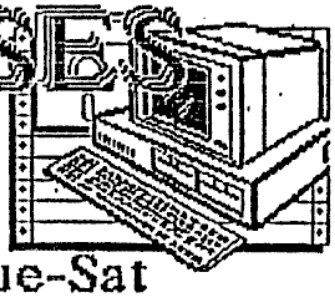

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